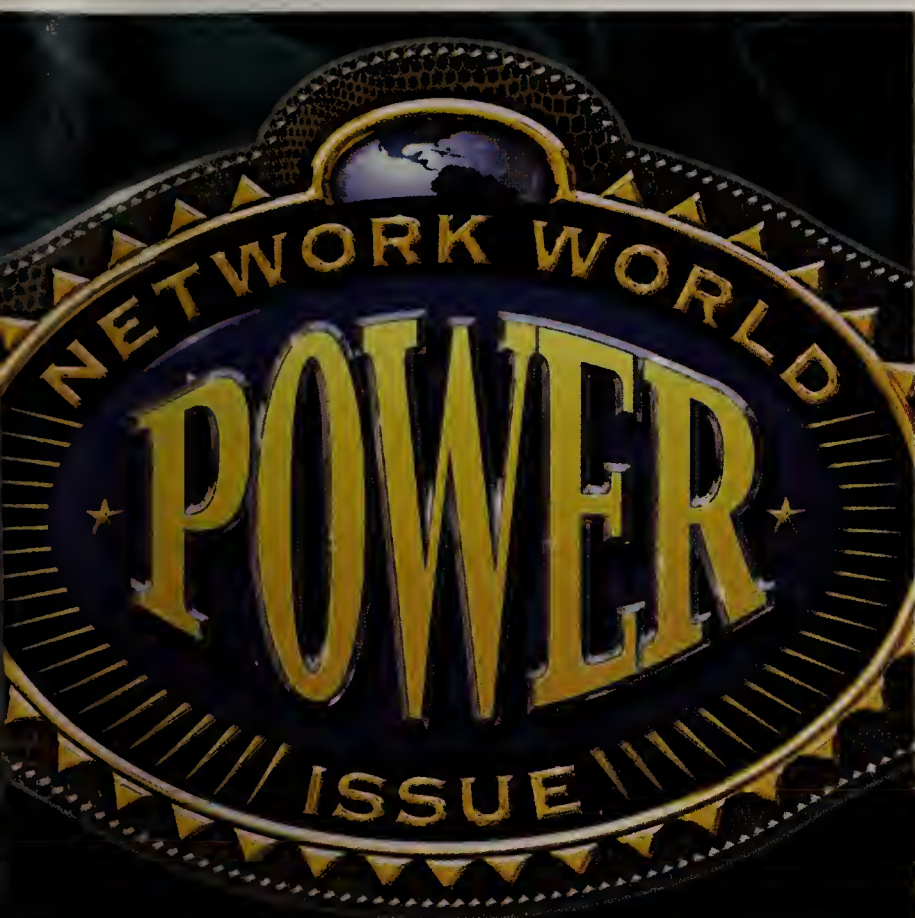


NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Torrent-ial routing
Torrent Networking's router could pave the way for advanced carrier services. Page 10.



Get primed for the new year with our fifth annual Power Issue. In this Signature Series special issue, coming next week, we'll give you a ringside look at the people, companies and technologies with the heavyweight titles in networking this year. The lineup includes the:

- Ten most powerful networking vendors
- Twenty-five most powerful people in networking
- Power struggles shaping the networking world
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CAPSTONE STUDIOS, INC.

Sprint ION limping to a site near you

Convergence offering has few beta users; doubts mount over carrier's strategy.

By David Rohde

Sprint's heavily hyped Integrated On-Demand Network (ION) services are supposed to be available next month, but few of the convergence devices are in place and few users have beta-tested the network.

Muddling the picture further, the No. 3 long-distance carrier last week said it no longer plans to use regional Bell operating companies as extensively as it expected for ION facilities.

ION is designed to blend voice, video and data over a single access link via an ATM box provided by Sprint. Those access links originally included RBOC-supplied dedicated SONET and digital subscriber line (DSL) dial-up links. But last week Sprint said it will largely provide its own DSL facilities for dial-up customers.

Moreover, *Network World* has learned that of the six ION beta customers announced in June, only two have even begun running traffic over the network, and only in the past few weeks. Sprint officials concede that of the four customers that remain, at least two no longer

plan to participate in beta-testing until well into next year.

The lack of outside testing, and Sprint's about-face regarding the role of the RBOCs, has rekindled previously expressed fears among analysts, especially those who doubted ION from *See Sprint, page 62*

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Then: ION to rely on RBOC-supplied DSL dial-up links.

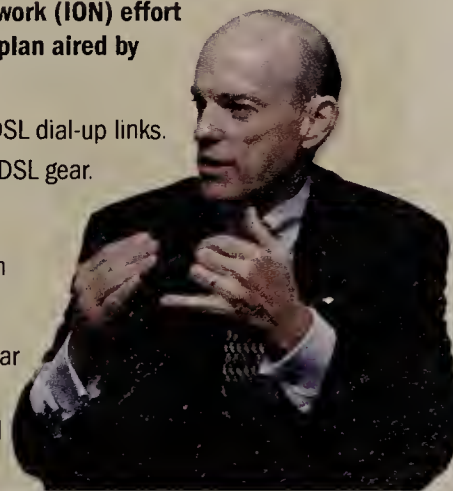
Now: Sprint says it will install its own DSL gear.

Then: Six beta users announced.

Now: Only two of those users have run traffic over ION.

Then: Cisco to supply on-premises gear for integrating voice and data traffic.

Now: Beta customers are using Nortel ATM gear to perform this function.



STEVE BORNS

HellsAngels.com

By Marc Songini

Looking to buy your Hells Angels T-shirt but wanting to avoid the holiday rush? Fear not. You can order directly over the 'Net. (Actual site is www.bigredmachine.com)

The door to the Hells Angels New York City clubhouse shut behind me, blocking out the light and noise of East 3rd St. I walked past a pile of orange safety cones used to reserve the Angels' parking spaces, glanced at the walls plastered with placards, and noticed a monitor beaming back images of the street outside from one of three closed-circuit cameras.

So this is what the inside of a Hells Angels hangout is like.

But this surprisingly quiet and cozy six-story building is not just a place where Angels meet; it also houses a thriving electronic commerce operation, bigredmachine.com, which sells an array of club merchandise.

Most e-comm headquarters cause nary a glance, but the Hells Angels attract a bit more attention. New York's finest tend to cruise by a couple times an hour to eyeball the place.

The U.S. government also monitors a Web site based in California dedicated to Ralph "Sonny" Barger, who is considered to be the unofficial chief of the notorious worldwide biker organization.

See Hells Angels, page 10.



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Directory roundup: A guide to who's backing what horse in the directory-enabled network race, what they're planning and when they might cross the finish line. **Page 49.**

MCI WorldCom reshapes ATM and int'l voice nets

By David Rohde
and Denise Pappalardo
Washington, D.C.

MCI WorldCom is moving rapidly to kill off overlapping parts of its combined networks.

Company officials last week confirmed they have decided to drop MCI's network for direct ATM service in favor of WorldCom's pre-merger ATM network, even though analysts say MCI has far more domestic customers.

At the same time, MCI WorldCom plans to shut down

three international voice switching gateways and migrate all of its voice traffic onto MCI's six international voice switching gateways. MCI WorldCom officials would not comment on those reports.

The moves could mean migration challenges for many users, but they are designed to help the company build a more seamless global data and voice network.

Although MCI WorldCom officials wouldn't discuss specifics, *See MCI, page 62*

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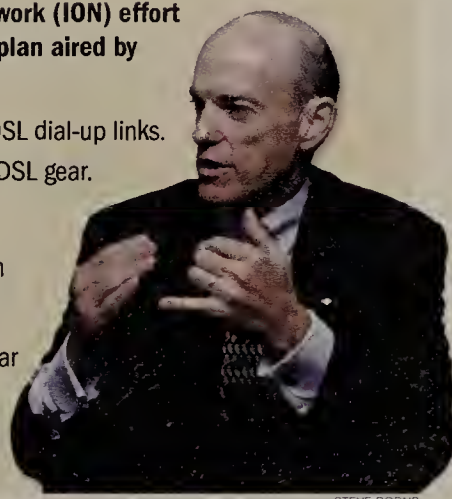
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STEVE BORNIS

Get more online:

- Our story about top executives and engineers leaving MCI WorldCom.
- A look at MCI WorldCom's use of Cisco ATM gear for handling IP traffic.

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See Hells Angels, page 62



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CRAFTY CRUSADER

Computer Associates CEO Charles Wang says the government shouldn't dictate development rules to software firms. Page 23.

STEVE BORNS


WATCH OUT FOR IP OBSESSION

Columnist Mary Petrosky warns that IP is not the only answer. Page 39.



MAINFRAME CHALLENGER

HP takes aim at high-end data center applications with its latest RISC-based server. Page 19.



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To quickly get to any online info referenced in *Network World*, enter its DocFinder number in the input box on the home page.



NetworkWorld Fusion
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This Week

Only on Fusion

ATM vs. Gigabit Ethernet. One reader wonders whether his bosses are making the right decision in building a backbone on ATM instead of Gigabit Ethernet because "of the heightened level of QoS that ATM offers." What do you think? **DocFinder: 9643**

Home networking. A reader is seeking tips for the best way to wire his house for a 100M bit/sec LAN. **DocFinder: 9642**

Windows networking. Yet another reader is experiencing problems with excessive ARP broadcasts on Windows 95. Can you help? **DocFinder: 9644.**

Keeping Current. Fred McClimans returns to the online mall and responds to readers who had things to say about his earlier comments. **DocFinder: 9646**

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Cool Tools: Check out the bonus features of Epson America's Stylus Color 850N printer and JetFax's JetFax M930 multifunction fax machine. **Page 46.**

News briefs, December 21, 1998

Building a bridge

■ Invoking the holiday spirit of togetherness, a group of incumbent and competitive telecommunications companies has teamed to develop protocols to bridge the public switched telephone network (PSTN) with IP nets.

The new Packet Multimedia Carrier Coalition outlined a technology for establishing traffic exchange and signaling requirements between PSTN and IP networks. Protocols developed by the group will be forwarded to the Internet Engineering Task Force and the International Telecommunication Union. The new group includes Level 3, Frontier Communications, GTE, ICG Telecom Group, Illuminet, IXC Communications, Nextlink Communications, NTT America, SBC Technology Resources, TESS LLC, Time Warner Telecom and Williams Companies.

Brooktrout goes fishing

■ Lucent last week sold its Computer Telephony Products division to Brooktrout Technology for \$29.4 million in cash. The deal could help accelerate the development of technology standards needed to boost the nascent computer telephony market. The unit acquired by Brooktrout develops hardware and software products that link PCs with LANs and telephone networks, as well as other voice processing technologies.

IP telephony harmony

■ Six companies have joined Lucent and ITXC to promote interoperability among IP telephony platforms. Ascend, Cisco, Clarent, Dialogic, Natural Microsystems and Siemens AG will support the interoperability Now (iNow) agreement that will be published in January. The iNow agreement defines how IP telephony gateways and gatekeepers interoperate. The specification, developed by Lucent and ITXC, is based on existing H.323 and H.225.0 voice-over-IP interoperability standards.

Two small steps for Microsoft-kind . . .

■ Microsoft last week shipped a new version of its Windows 2000 beta software. Dubbed Release Candidate 0 for Beta 3, the interim code improves on Beta 2 by including Active Directory Services that are easier to set up, a multimedia device driver, and better integration with Microsoft's Windows Terminal software. Microsoft delivered the code to 1,000 technical sites, and another 16,000 developers accessed it via Microsoft's Web site.

The folks in Redmond also announced that Service Pack 2 for Exchange Server 5.5 will be posted by year-end and will include minor utility and feature enhancements.

General DataComm reshuffles

■ In an effort to return to profitability, General DataComm (GDC) last week announced a sweeping corporate restructuring. Company Chairman and CEO Charles Johnson says GDC will split into two units: Broadband Systems, which will focus on ATM switches; and Network Access, which will handle modems, multiplexers and access concentrators. In an attempt to cut costs, the company is slashing about 200 jobs, or 14% of its work force. GDC is also putting its U.S. and U.K. headquarters up for sale and plans to move the operations into leased buildings. The restructuring plan is called Millennium 30, a reference to the turn of the century and GDC's 30th anniversary.

Holiday e-junk trashes nets

By Paul McNamara

Experts who a month ago predicted that a holiday blizzard of multimegabyte e-mail attachments would cripple corporate servers now say the problem has proven worse than they had even feared.

Electronic greeting cards, festive screen savers and amusing executables are all the rage this yuletide, but they are also an increasingly nettlesome drag on network performance and a voracious consumer of disk space (NW, Nov. 23, page 1).

Here are some signs of the times:

- An Ohio-based e-mail outsourcer, AllegroNET, reports a fivefold increase in holiday-related traffic over 1997, with some multimedia attachments weighing in at a portly 7M bytes and recipient lists created by single senders stretching to 100 addresses.

- A global pharmaceutical company's New Jersey mail hub crashed under the strain of an unprecedented number of holiday messages just days before a scheduled hardware upgrade that was, in part, intended to prevent exactly that fate.

- Thousands of AT&T WorldNet customers suffered e-mail delays of up to 45 minutes when a spike in volume unexpectedly preceded the ISP's planned installation of two new servers.

- A number of filtering and e-mail management vendors, including Worldtalk, Content Technologies and Tally Systems, are suddenly marketing products specifically as antidotes to holiday messaging blues.

"This season more so than last year we're feeling the crunch on the e-mail slowdowns," says Scott Bentoske, network administrator at FEC, Inc. in Detroit. "I'm seeing all the same ones from last year [such as snowman.avi and rudolph.exe], plus new ones, including the snowman eating the dancing baby."

Volumes have "at least doubled in the past few weeks," says Bentoske, who adds that the messages have caused backlogs that have "crippled our e-mail server to the point of very slow performance and/or completely bringing it down."

A 5M-byte per message limit

and a stern memo to employees have allowed FEC's system to regain its equilibrium, he says. Such steps have become the countermeasures of choice for e-mail managers, along with the use of increasingly popular filtering software.

"Our New Jersey mail hub crashed due to the increased volume of e-mail," says Brian Holle, manager of groupware

three hours I'm pulling off junk files the equivalent of your entire hard drive."

John Kemp, vice president of IS at Lion Apparel in Dayton, Ohio, says he was surprised to learn how heavily the holiday cheer was pouring into and out of his shop.

"We ran a test when the filter was first put on, and the first three hours turned up 11 high-megabyte files," he says.

Lion's T-1 connections can keep up at this point, but Kemp remains worried about future traffic levels and the impact on storage space. "Things like this need to be addressed early on before the pipe fills up," he says.

As bad as the holiday headache has been this year,

experts are concerned the challenge could prove greater come 1999.

"We live and die by our e-mail," says Brian Arehart, manager of IS at Aida Dayton Technologies. "As not only the business world but the general public gets more comfortable with e-mail as a method of communications, increasing background noise will become a greater problem." ■



E-mail administrators say one of this year's most popular — and bothersome — holiday greetings has been an executable called *tree.exe*.

services at Roche Bioscience in Palo Alto. "That New Jersey site was planning to upgrade its mail hub to a DEC Alpha 4000 on Saturday, but decided to shut down the crashed mail hub on Friday and start the Alpha upgrade early."

Last year, Roche encountered a similar problem at its Palo Alto facility that prompted a hardware upgrade there.

"You're threatened by this problem on several levels," says Richard Bliss, an executive at AllegroNET. "You're threatened on just the pure choking of your e-mail system; you're threatened on the potential for virus/executable damage; and you're also threatened on the legal ramifications."

Foremost among the latter concern would be the potential for a sexual harassment lawsuit because some of these holiday missives feature stripping cartoon characters and anatomically enhanced snowmen. AllegroNET recently started offering free filtering services to anyone interested in plucking these holiday files — naughty or nice — out of their message stream.

Sheer volume remains the primary problem, however.

"We are now pulling off about 1G byte of this stuff an hour," Bliss says. "Most hard drives are about 3G, so every

Go online to discuss the problem at www.nwfusion.com.
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CORRECTIONS

A recent news brief (NW, Dec. 7, page 41) on Net-It Software should have referred to the firm's new name as Allegis Corp.

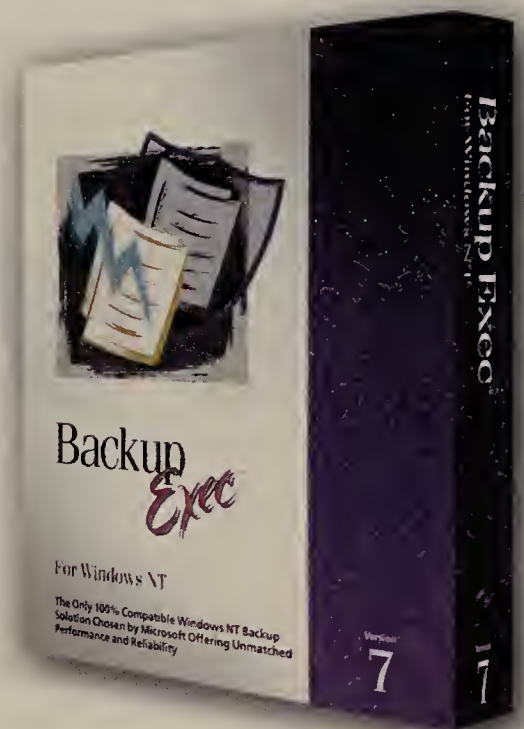
A recent story (NW, Dec. 14, page 8) incorrectly stated that Sendmail, Inc. had acquired MetaInfo, a division of Check Point Software Technologies and maker of Sendmail for Windows NT. MetaInfo has granted Sendmail an exclusive license to market that product.

Windows 2000
BETA 3

A SPOONFUL
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IBM looks to 'reinvent' sendmail

Big Blue gets into Internet e-mail agent market one week after commercial sendmail debuts.

By Paul McNamara

Yorktown Heights, N.Y.

One week after announcing a commercialized version of the free sendmail software that routes most Internet e-mail, Sendmail, Inc. has a new heavy-weight competitor: IBM.

Big Blue claims that long-running security concerns about open source sendmail prompted the company's researchers to develop a free, open source message transfer agent (MTA) of its own, called Secure Mailer. The new MTA runs on IBM's AIX, and MTA code is available for download from www.ibm.com/alphaworks.

As might be expected, Sendmail executives and loyalists take exception to IBM's criticism of the MTA, which has played an integral role on the Internet since it was written

by Eric Allman in 1981. However, even they praise IBM for jumping on the open source bandwagon, calling the move essential for maximizing overall Internet security



"Sendmail is probably the most scrutinized program on the Internet at this point."

Greg Olson, CEO, Sendmail, Inc.

a hardware/software engineer at Vitana Corp. in Gloucester, Ontario. "Sendmail handles nearly all of the Internet's traffic, has a 20-year history, and, although it's somewhat buggy and sometimes has security problems, [the latest version] has most of the bugs ironed out."

However, Giddings does see long-term potential in IBM's decision.

"I like the fact that IBM is willing to go open source with its new prod-

uct," Giddings says. "Open source software is a great concept. I make a living writing software, and yet I still feel that things would be far better if all

through the sharing of innovative ideas. "Secure Mailer is an OK concept, but it's really reinventing the wheel," says Ben Giddings,

aren't enough to get users to make the switch from Cisco, Torrent has equipped the IP9520 with a Cisco-compatible command line interface, which makes IP9520 configuration easy for users who are familiar with the 7500. IP9520 also emulates Cisco NetFlow traffic classification and statistics information, and is fully compatible with the 7500 in large Border Gateway Protocol (BGP) environments, Saussy claims.

Torrent to unveil high-end gigabit router

Router aimed at Cisco's 7500 in ISP POPs for delivery of data services.

By Jim Duffy

Silver Spring, Md.

A year after shipping its initial product, start-up Torrent Networking Technologies this week will unveil its second offering, a high-density gigabit router designed to help service providers deliver new data services to users.

The IP9520, which is being evaluated by Extranet, an ISP in New York, and VAS-Net, an ISP in the U.K., will make it easier for enterprise users to outsource their WANs and take advantage of advanced services, such as virtual private networks and IP fax, voice and video, according to Gordon Saussy, Torrent vice president of marketing.

"Enterprise WANs are going to be outsourced completely to service providers," Saussy says. "And enterprises that are outsourcing WANs are going to see new options emerge. Service providers and carriers are going to be able to deliver high-availability, high-speed advanced Internet services" with a product such as the IP9520, he claims.

The IP9520 is a denser, more resilient cousin to its predecessor, the IP9010. Torrent

claims to have shipped more than 50 of the eight-slot, 10G bit/sec IP9010s, which have been available for about a year.

Currently, most service provider points of presence (POP) are populated with Cisco's 7500 series routers for delivery of Internet data services to end users. With performance in the 500,000 to 1 million packet/sec range, these software-based routers are only adequate for basic Internet services, such as e-mail, FTP and Web surfing, Torrent claims.

If users are looking to offload some business-critical private network functions onto the Internet — such as internal voice communications and trading with external business partners — POPs are going to need a high-speed, high-density, fully redundant router that can forward tens of millions of packets per second and guarantee quality of service, Saussy says.

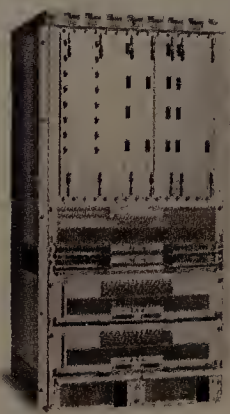
That's where the IP9520

comes in. The 20G bit/sec router features 15 slots for DS-3, OC-3 and OC-12 WAN interface modules. The IP9520 can support up to 120 DS-3s and OC-3s, up to 60 OC-12 ATM or packet-over-SONET links, and up to 3,136 T-1s and more than 14,000 fractional T-1s.

For redundancy, the IP9520 also sports dual hot-swappable fan trays, switch fabric cards, route processors and power supplies.

By contrast, the high end of Cisco's 7500 line, the 7513, features 13 slots, and optional redundant route/switch processors and power supplies. The IP9520, according to Torrent, supports almost four times as many DS-3s, three times as many T-1s and thousands more fractional T-1s than the 7513. Cisco also recently announced the 7576, which is essentially the 7513 split into two separate routers for redundancy.

If density and redundancy



Torrent's 20G bit/sec router enables advanced services.

"Sendmail is probably the most scrutinized program on the Internet at this point," Olson says. "Given that it runs more than 75% of the Internet's servers, the MTA has been hardened in the fire of the trenches." ■

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THE MICROSOFT DIARIES

Week Eight

The Microsoft-DOJ Trial

MONDAY, DEC. 14

Finally, after eight weeks of testimony, the government gets to the root of its case against Microsoft. Today the feds brought in a witness — a computer science guru from Princeton University — who said he and two graduate students built a program that separates Internet Explorer features from that of Windows 98. The program doesn't actually uninstall Explorer 4.0.

"The idea here is . . . not to take away the choice of a user to use Internet Explorer 4: It's to restore choice to use an alternative Web browser," said Princeton's Edward Felten, a computer scientist. He said there is no technical reason for the forced integration. Justice attorney David Boies called this testimony "devastating for Microsoft."

But Microsoft lawyers badgered Felten until he admitted that he could not remove all the Explorer files without significantly impairing Windows. Still, Felten said, "I know of no reason why Microsoft was technically compelled to design the product that way."

Felten's program worked fine until Microsoft, which had access to the professor's code through the court discovery process, issued an update to Explorer 4.0 that stopped the separation.

TUESDAY, DEC. 15

Might as well have gone to the movies today. The feds opted for videotaped testimony from Disney and Packard Bell executives over live witnesses. The clips are being used to back the government's claims that Microsoft uses its power over its partners to attack competitors. Ironically, Gates' testimony offered the most damaging evidence against Microsoft.

Lead attorney Boies questioned Gates about a March 1994 memo in which Microsoft's CEO complained about IBM's penchant for working closely with Lotus. In the memo Gates posed the question: "Is there anything we can do about this?"

Microsoft's senior vice president for OEM sales wrote back, saying Microsoft needs a "[worldwide] hit team to attack IBM as a large account, whereby the OEM relationship should be used to apply some pressure."

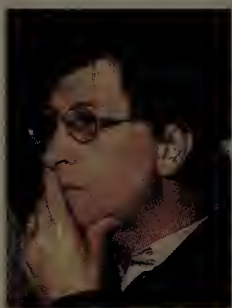
WEDNESDAY, DEC. 16

Microsoft may just have a point about what the Netscape/America Online deal means for the software industry. That news flash just in from the man who will ultimately determine the outcome of this trial: Judge Thomas Penfield Jackson. He said today the proposed merger "could have an immediate effect on the definition of the market."

That statement came after Microsoft petitioned the court for the right to look at any documents the Department of Justice may have in its possession pertaining to the Netscape/AOL deal, which is subject to Justice Department approval. Jackson said Microsoft has the right to look at the documents, but he did not officially rule on the motion. He instead told the two parties to work it out on their own.

With that, the judge dismissed everyone for the holidays with the trial set to resume Jan. 4.

— Christine Burns



Gates hurts himself.

Start-up breaks into security market

Former Security Dynamics, Haystack Labs officials start new venture.

By Bob Brown
Needham, Mass.

Start-up Shym Technology, Inc. next month will try to wedge its way into the crowded network security market with tools designed to make it easier and less expensive for companies to safeguard applications and electronic transactions.

The company, formed by a group of security industry veterans, will roll out packaged middleware that links existing enterprise resource planning, messaging and other applications to public-key infrastructure-based (PKI) security products. PKI users, vendors and systems integrators currently have to put in the time and go to the expense of establishing such hooks.

While the term PKI may sound intimidating, basically it refers to using encrypted keys and digital certificates to protect data and ensure that network users are who they say they are. A growing number of companies are turning to PKI to anchor their enterprise network security schemes rather than manage a bunch of separate application-specific security systems.

"PKI projects can cost \$1 million to implement, and it's taking some customers as much as 12 to 18 months to roll the projects out," says Mike Rothman, Shym's executive vice president. "We see an opportunity to help customers cut costs and roll out projects faster."

PKI implementations are largely in the pilot stage today, but leading PKI vendors, such as Entrust Technologies and Verisign, have been posting big revenue gains and can point to production implementations involving thousands of users. SoundView Technology Group says the PKI market has been doubling in size from year to year and could hit the \$1 billion revenue mark by 2001.

In rolling out its first software packages next year, Shym hopes to cash in on what it expects will be a PKI explosion over the next few years as electronic commerce and other extranet applications force more companies to install solid network security systems.

The company has several

things going for it, including nearly \$4 million in venture capital and an experienced management team. Three of Shym's four founders, including CEO and President Jim Geary, followed the same path from Security Dynamics Technologies, Inc. to intrusion detection vendor Haystack Labs to Trusted Information Systems, Inc.

Currently, Shym has about 20 employees, two-thirds of them on the technical side of the house.

formal debut on Jan. 11.

Shym's technology appears to be sound, says Eric Hemmendinger, an analyst at Aberdeen Group in Boston who has been briefed by the start-up. But he says the company's long-term viability will be tested as PKI vendors forge their own relationships with applications vendors. Entrust and SAP AG, for example, recently signed a deal to integrate their offerings, and similar alliances are bound to follow. If enough of these deals

PROFILE: SHYM TECHNOLOGY, INC.

Headquarters: Needham, Mass.

Founded: May 1998

Primary business: Simplifying the deployment and reducing the cost of public-key infrastructure security systems.

Management: CEO is Jim Geary, a security industry veteran who has done stints at Security Dynamics, Haystack Labs and Trusted Information Systems; Executive vice president is Mike Rothman, a former Meta Group vice president and analyst.

Funding: \$3.85 million from North Bridge Venture Partners and Venrock Associates

Fun fact: Founders Geary and Rothman first discussed plans for the company while in a beer line at a Red Sox-Yankees game.



Jim Geary

Shym officials declined to share specifics on the company's product strategy. However, Geary did say the company's tools will complement, rather than compete with, products from PKI market leaders.

Shym, which gets its name from the term shim (which means wedge), plans to have its

happen quickly, these existing vendors could obviate the need for Shym's software, Hemmendinger says.

But Shym's Rothman says PKI vendors are focused on delivering the best security products they can and would rather leave integration issues to others. ■

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This week's question:

What's the name of the Linux operating system's penguin mascot?

www.nwfusion.com

Cisco switches prepped for voice

By Jim Duffy
San Jose

Next year Cisco will add voice to its LAN switches, letting customers take advantage of a new class of applications and save money by putting voice and data on the same network.

In the second half of 1999, Cisco will roll out new versions of its Catalyst 8500, 5000 and 4000 series switches that can handle call processing and LAN telephony gateway applications. Customers will be able to set up distributed call centers, voice-enhanced PC conferencing systems and customer service help desks with the new switches, says Mario Mazzola, senior vice president of Cisco's Enterprise line of business.



Boxes like the Catalyst 4000 will support voice next year.

Cisco is not the only internetwork vendor attacking the LAN telephony market. Rival 3Com recently formed a \$100 million joint venture with telecom giant Siemens (NW, Dec. 14, page 10).

But while 3Com is relying on voice expertise from a telecom stalwart, Cisco appears to be going it alone. Specifically, Cisco has been bolstering the packet forwarding, priority queuing and quality-of-service capabilities of the Catalyst line to reduce latency, delay and jitter for voice traffic. Cisco is also enhancing the switches' ability to forward traffic in real time for video applications, he says.

The company is also integrating into the Catalyst line PBX and call processing technology obtained from its October acquisition of Selsius Systems, Mazzola says. "The switch fabric, internal delays and priorities, and global jitter of the platforms have been worked out in such a way that all these platforms will be capable of supporting call processing-related applications," Mazzola says.

Cisco will roll out its voice-enabled Catalyst switches in phases. Next summer, Cisco will unveil products for branch offices of 20 to 400 users, he says. The firm will unveil more scalable platforms for larger enterprises in 2000.

"Our perception is that we will be able to scale up to 50,000 users," he says.

Adding voice to the Catalyst switches will open up the \$18 billion to \$20 billion PBX, call center and voice messaging market to those products, Mazzola says.

Reliability is key to making it possible,

Mazzola admits. The jury is still out on whether packet-switched data infrastructures can provide the same reliability that circuit-switched nets have delivered for decades (NW, July 20, page 27).

Perhaps reliability is the reason users have only dipped their toes into the voice/data convergence waters. "Right now, Kodak is not interested in integrating voice and data networks onto a single

wire," says Eric Pylko, global systems coordinator at Eastman Kodak in Rochester, N.Y., a large Cisco Catalyst switch customer. "We have one or two pilots going with Cisco 3810s at remote offices."

Cisco MC3810s are multiservice access concentrators for integration of data, voice and video onto public or private frame relay, ATM or leased-line nets. ■

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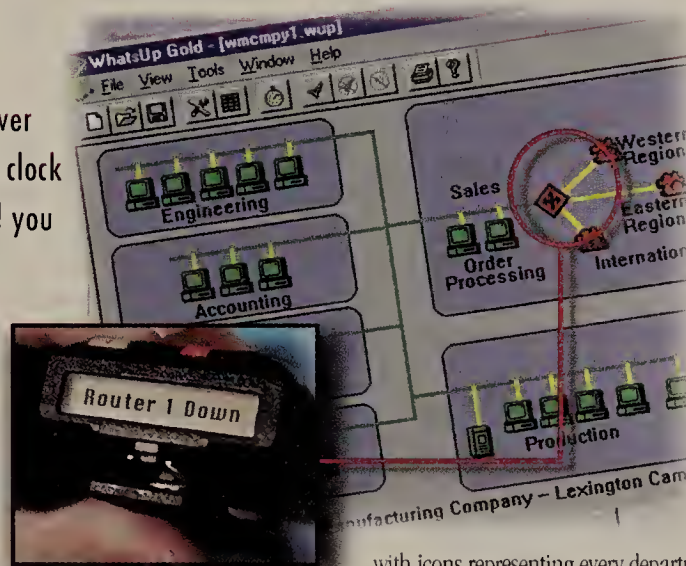


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Hells Angels

Continued from page 1

Barger's site received more than 100 hits from government officials in October alone. The site sells statues of the man some consider a folk hero and others call a criminal.

The Angels' products are not for everyone. One T-shirt says, "WHEN IN DOUBT . . . KNOCK 'EM OUT!" A bumper sticker says, "SEE YOU IN HELL!" Some of this stuff has logos that are unprintable.

The Web site's offices, located several floors up, consist of a few rooms full of T-shirts, hats and other gear packed into plastic containers; on a desk sits a slider used to verify American Express cards.

Our guide is the soft-spoken, black-leather-clad Helene Czech Garcia, who is the head of the New York chapter's Internet-based business.

As we talk, Garcia casually mentions that she just added nose cones from the original Hells Angels World War II fighter bombers to the catalog. Not many know that the Angels began nearly 50 years ago when fighter pilots fresh from the war were looking to raise some hell.

The New York chapter's Big Red Machine Web site (one of about a dozen worldwide) is Garcia's brainchild. The wife of a club member, Garcia

decided to launch the site a couple of years ago primarily for direct sales. Before the Web, sales were driven only by direct mailings and Big Red Machine ads in Easy Rider and other biker magazines.

"We wanted to target international customers and ones not accessible by mail but who



have access to a computer," Garcia says. So back in 1996, she headed to the Web, getting a local service provider to do the hosting while she did the design. So far it's been successful in expanding the business. Hells Angels gear "sells itself," Garcia says. Just how much she won't say, although she acknowledges the club moves hundreds of items a year worth thousands of dollars.

The New York Big Red Machine site sells gear from a number of Hells Angels chapters to a wide range of people. "We do a lot of business in Japan," Garcia says. "And someone in Thailand can look and say, 'That's a cool shirt on there' and order it. They know who the Hells Angels are. It's amazing; it's such a small

world." According to Garcia, the club really has no competitors — after all, there is only one Hells Angels.

Working on a Windows 95 PC, Garcia does her Web updates using Adobe PageMill. Security and server tools are provided by the ISP. Payments are made by the usual e-commerce means, such as credit cards.

Like many Web site managers, Garcia has a hard time keeping up with all the correspondence: As many as 160 e-mail messages per day go through her Eudora mail basket. In fact, a fair number of the members of her chapter are online. Garcia also posts the dates of Angels parties, and in the future, she'd like to create a chat room.

Some of the money raised on the Angels' Web sites goes to the various clubs' legal defense funds. For instance, the West Coast of England chapter (www.wcoast65.freemove.co.uk/) sells clothing to pay the legal costs of a "brother" given 10 years for "manslaughter with provocation."

One man's opinion

George Christie is a prominent Ventura, Calif.-based Hells Angels member. Christie, speaking from his Ink House tattoo shop, says the group is just changing with the times. "The Internet is a way to reach out to a lot of people," he says. Christie's chapter in Ventura is about to launch its own Big Red Machine Web site.

The managers of the Angels' Web sites do not view themselves as competitors. "We're all part of the same organization," Christie says. Although not a Web surfer himself, Christie says a number of the members of his chapter are. But browsing and blending with the rest of society are two different things. "I have never felt part of mainstream society and don't think I ever will," he says. "I don't feel any different than I did 25 years ago."

Another thing that hasn't changed is the willingness of the Angels to defend their turf. Witness a recent e-mail exchange from a Swedish Angels site (www.insidetheweb.com/messageboard/mbs.cgi/mb36607). After someone wrote that the Angels "are simply the best, of course, besides

the Bandidos," a man named GRUMPY replied, "This is the wrong neighborhood for that kind of talk."

The authorities' take

Law enforcement officials are not totally surprised by the bikers' Web presence. "They are a very sophisticated organization, despite what some people believe," says Terry Katz, a lieutenant in the criminal intelligence bureau of the Maryland state police. "They're not just barroom brawlers. They have a reputa-

What's with Big Red?

By now you may be wondering where the name "Big Red Machine" comes from. Why not hellsangels.com?

For the answer, we turned to the testimonial of club member Tricky Tramp, which was posted on the Windsor, England, site (www.cityweb.co.uk/brm/). According to Tramp, a group of Angels spontaneously coined the term during "a stoned night in Amsterdam" in 1989. The "most righteous brothers" were staring at a poster of "a



Helene Czech Garcia — Web master for the Hells Angels NYC chapter's Web site.

Welcome to the club

The outside of the Hells Angels' club is menacing — and oddly inviting. There are two winged death's-head placards decorating the facade, and the front door is painted with a flaming death's-head biker. A sign warns: "NO PARKING EXCEPT AUTHORIZED HELLS ANGELS." A half dozen custom, and presumably authorized, Harleys are parked neatly nearby.

There is also a sign that says, "HELLS ANGELS WELCOMES YOU TO NEW YORK CITY" and the entire fire escape is hung with Christmas Tree lights. Listen carefully and you can hear music from a local radio station that the Angels pipe softly out onto the street.

Across the street is the Internet Café, where you can have a brew and surf the World Wide Web.

Inside the clubhouse is the members' private club (this reporter failed to get an invite), with what looks like a bar. There is also a sign with a quote from Angels founder "Sonny" Barger that reads, "What you see in here, and hear in here, stays in here."

— Marc Songini

tion for violence and intimidation, but they can be charming."

Hence the club's sponsoring of Toys for Tots bike runs and other public-relations opportunities.

"They have an impressive ability to expand," Katz says. "They're very conscious of their image."

Moreover, Jack Levin, an author and criminology professor at Northeastern University in Boston, has some concerns.

"Every shadowy organization in existence is on the Web and attempting to make money out of it if it works," Levin says.

Teenagers who are drawn to anything that appears rebellious are the most likely to respond to such Web sites, Levin believes.

bearded head blown brother roaring at you via the walls and bars of a jail"; during a burst of inspiration, the group, whose official colors are red and white, began to chant the phrase "Big Red Machine," again and again, Tramp relates.

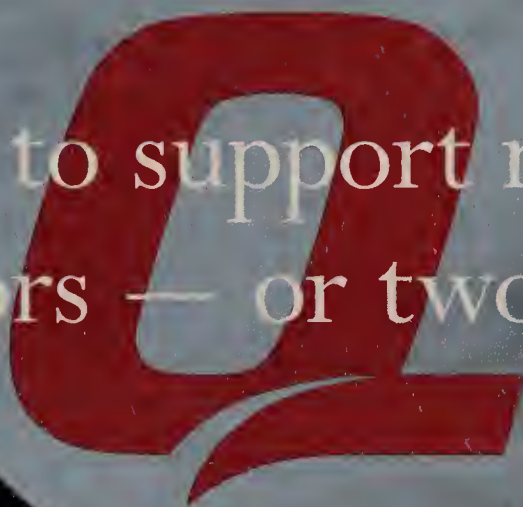
Eventually, they created the Big Red Machine logo — which indicates support for the Hells Angels but avoids trampling on the precious death's-head trademark. Consumers are free to wear Big Red material, but the actual Hells Angels logo remains strictly for members.

The head Angel

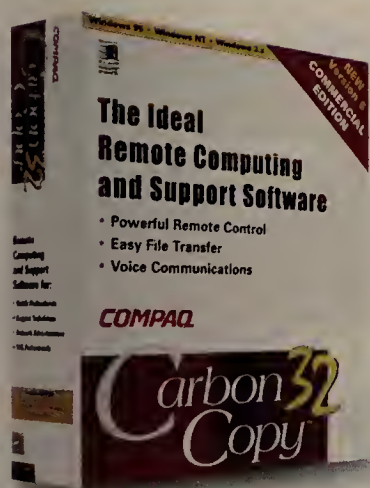
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See Hells Angels, page 16

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Opticom tool helps manage network devices

AssetView works with Cabletron's Spectrum; puts data in Web-friendly format, identifies underutilized equipment.

By Jeff Caruso
Manchester, N.H.

Start-up Opticom, Inc. this week will unveil software to help network managers keep better track of what network devices they have and how often the devices are being used.

The company will introduce AssetView, an application that not only discovers network devices via Cabletron's Spectrum network management platform, but also learns what boards populate the slots in a router or switch.

The application is part of Opticom's Executive Information System (EIS), a software suite that runs on Solaris and communicates over a network to extract data from Spectrum, analyze the data and

present reports. Other components of the suite include an application that highlights network outages and another that shows which network devices

are susceptible to the Year 2000 problem.

Opticom in coming months plans to make EIS work with other network management platforms, including those offered by Computer Associates, Hewlett-Packard and Tivoli. Next month, Opticom will port its software to Windows NT.

Opticom in February plans to unveil another application for the suite called CapacityView. The application will look at utilization levels at potential points of congestion in the network, such as uplinks to LAN backbones and WAN connections. The software will then alert

network managers to imminent bottlenecks.

ISP GTE Internetworking uses AssetView with Spectrum for its internal network, to see where switch and router ports are being used at different sites. "It gives us an idea of changing demographics and users moving around," says David Caplan, senior member of GTE's technical staff.

Caplan points out that Spectrum has its own inventory reporting capabilities, but says it's difficult to use and automate, and it doesn't put data in a Web-friendly format. AssetView addresses these issues.

The AssetView software also indicates places in the network where gear is underutilized, says Kate McRae, a consultant at Renaissance Worldwide, a

consulting firm in Newton, Mass.

Though users might be tempted to buy the latest and greatest equipment, companies could use this tool to find out where they should deploy the equipment they already have.

AssetView can see into network hardware from multiple vendors, and retrieve firmware levels and serial numbers from individual boards within a chassis.

Caplan says he'd like to see the software tied to actual depreciation figures as well, so that it would be easy to determine a company's investment in the devices in its network.

AssetView is shipping now for \$10,000.

© Opticom: (603) 656-8800

Hells Angels

Continued from page 14

\$300 statue of the Angels' organizational architect Barger astride a Harley. The site plans to sell Barger's in-the-works biography when it is published, as well as a video based on the book.

"He's an American legend," says Jack Lupertino, a long-time friend of the 60-year-old Barger, and manager of the Web site.

Based in Santa Cruz, Calif., Lupertino is a member of the Ghost Mountain Riders, an Angels affiliate. It was Lupertino's idea to create the

statue of Barger and market it over the Web; he sealed the deal with Barger with a handshake.

Lupertino got a friend to set up the page, and the site went

that Barger's fame translates well on the Web.

The hits the Barger site gets are from all over the world — Russia, South America and New Zealand, for example. Lupertino makes note of the 100 hits from the U.S. government. Whether it was the Justice Department or some other agency, he doesn't know.

"All we do is sell statues," he says. "I don't know why the government is interested in that."

Especially since Lupertino dropped ads from pornographic and tattoo companies.

Passing comments through Lupertino, Barger says he's



live in June; in October, it received 20,567 hits. "The thing's potential is phenomenal," says Lupertino, who adds

tino dropped ads from porno-

graphic and tattoo companies.

Passing comments through Lupertino, Barger says he's

Choppers galore! Biker-hosted Web sites flourish

The Angels are not the only bikers roaring onto the Web. There are the Houston-based Hombres, at www.wl.net/hombresmc/welcom.html (which won the Best Biker Site distinction from BikerTrash Webzine); the Blood Brothers, at www.psicop.com/BloodBrothersMC/index1a.htm; the Biker Scum organization at www.users.cts.com/king/d/drlubell/bscum.html; and the all-female Ebony Queens Michigan chapter at mlss15.cl.mu.edu/~bambam/eqmc2.html, with a tribute page to fallen members Wicked Wanda and Funky Kold Madina, each one labeled an "Eternal Queen."

The New York chapter of the Desperados can be found at www.geocities.com/MotorCity/Downs/1396/ny.html. The group's site comes complete with live mIRC Talk Channel, where "Both Friends and Supporters Hang And Share Our Lifestyle . . ." and so on.

Like the Angels, a number of the other biker sites are e-commerce-based and offer various gear, such as T-shirts and bumper stickers. Others are simply looking for a few good men — or women — to hop on their hogs and come along for the ride.

— Marc Songini



Here's the place to buy Hells Angels T-shirts — and a lot more.

amazed at how many people are hitting his Web site, and that the rapid growth of the medium is like nothing else he's ever seen.

Barger notes that today there is more e-mail shuttling back and forth than regular

paper mail. "Information is the most important thing we have in running this world," Barger says. ■

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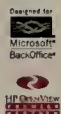
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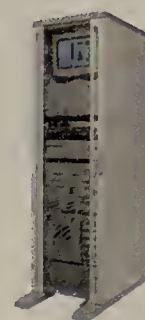


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Briefs

■ **Alcatel** last week finalized its **acquisition of Packet Engines**, a Spokane, Wash., maker of Gigabit Ethernet and Layer 3 switches. Alcatel in October announced it would acquire the start-up for \$315 million. Packet Engines will keep its name and remain in Spokane.

■ **Xiotech** has introduced **RediCopy**, online data mirroring software, for its Windows NT and NetWare-based Magnitude storage subsystems. The software allows data to be backed up from one Magnitude disk to one or more other disks at 1G byte/min while the source drive stays online and accessible. RediCopy is useful for applications that require disks to be available at all times, such as instant backups and Year 2000 testing. The software costs \$16,000 and allows mirroring of disks across as many as eight servers.

☎ Xiotech: (612) 828-5980

■ **Novell** last week announced it has **invested a total of \$9 million in five software start-ups** through its venture capital fund. The funding recipients are Web security company EnCommerce; Web design and authoring tool vendor NetObjects; object broker developer ObjectSpace; enterprise applications company Obliz; and Orbital Technologies, a maker of expertise matching and profiling technology. In exchange for its funds, Novell gets minority stakes in and an advisory role at each company. Novell has dedicated \$50 million to its Internet venture fund, which it uses to invest in firms whose technologies take advantage of Novell's directory technology. Previous Novell funding recipients include Evergreen Internet, GlobalCast Communications, NetPro Computing and NetVision.

Microsoft giving Win CE a makeover

By John Cox
Redmond, Wash.

Microsoft is readying real-time computing features for its tiny Windows CE operating system that could result in the software being used in devices ranging from milk testers to vending machines.

Windows CE 3.0 will be designed to speed up data processing and improve the accuracy of transactions handled by such devices as they are connected to IP networks with access to corporate applications.

Windows CE was developed as the core software for computers that don't look like the classic desktop or laptop PCs, such as handheld devices, palm-sized computers and Web phones.

But with Version 3.0, Microsoft is extending the software for use as an embedded operating system — that is, software running on microprocessors and stripped down to a minimal or nonexistent graphical user interface.

Microsoft expects to issue Version 3.0 around October 1999, says Tony Barbagallo, Microsoft's group product manager for Windows CE.

The key goals are to reduce CE's response time from about 250 to 300 microsec to 50 microsec; add nested interrupts, which let CE drop one task and handle a second task that has a higher priority; and boost the number of priority levels from eight to 32 for more precise control over tasks.

"These enhancements will open CE to a whole new level of applications that couldn't live with the real-time performance of CE today," says Richard Eppel, president of Annasoft

Systems, a San Diego developer of CE tools.

"Microsoft wants to make CE the standard platform for embedded systems," he says.

But this is a market in which Microsoft faces a host of mature

pendent software developers can build on top of," says Mal Raddaxlgoda, senior technology analyst at real-time software vendor QNX Software Systems in Kanata, Ontario. "But this market is not about platforms.

and less reliable than more established embedded operating systems, Raddaxlgoda says.

Barbagallo says he doesn't see CE "fitting into every single embedded device category.

If you only need a 2K-bit ker-

EMBEDDING WINDOWS CE

Microsoft next fall will release **Windows CE 3.0**, a version of the company's embedded operating system that could find a home in all sorts of microprocessor-based systems, such as:

- ☑ Webphones that combine cellular voice with Internet browsing and mini-applications.
- ☑ Video game consoles that feature highly interactive, multimedia programs.
- ☑ Webpads, which are small, wireless, handheld devices for Internet access that are based on a reference design from Cyrix.
- ☑ Check scanners, such as those from Unisys.
- ☑ Milk testers from vendors, such as IDEXX Laboratories.

But CE 3.0 will lack the oomph of traditional real-time operating systems used for applications, such as:

- Antilock braking systems
- Nuclear power station monitoring
- Network routers



Check scanner



Milk tester

rivals and promising upstarts. 3Com's Palm Computing division claims more than two million users of its PalmPilot and Palm III handheld devices.

"Microsoft refers to CE as a 'platform' — software that inde-

It's about the ability to customize the operating system to meet very diverse application requirements."

Even if Microsoft reaches its performance goals with CE 3.0, it will remain bulkier, slower

nel, you probably don't need us," he says.

However, he says users familiar with Microsoft's Component Object Model and Win32 APIs should feel comfortable with CE for many applications. ■

HP powers up new Unix server

Top-of-the-line RISC-based system is designed to challenge mainframes.

By Deni Connor

Hewlett-Packard has blown the top off its Unix server line with a new high-end model that includes up to 32 RISC processors and is designed to run heavy-duty data center applications.

HP's 9000 V2500 systems can be linked to form 128-processor clusters, and the clusters can be combined to establish systems boasting more than 2,000 440-MHz CPUs. HP says the new servers can process up to 100,000 business transactions per second.

"HP can now compete with mainframes, such as the System/390, for the big online transaction processing applications, enterprise resource planning applications and



HP says its 9000 V2500 server processes up to 100,000 business transactions per second.

data warehousing or decision support applications," says Steven Josselyn, a research director at International Data Corp. in Framingham, Mass.

The offering supports up to 128G bytes of RAM and 112

PCI slots. The server can be configured with SCSI-2, Ultra2 SCSI, ATM, Fibre Channel, token ring, FDDI or 10/100/1000M bit/sec Ethernet controllers. It can be outfitted with up to 64 drives supporting a maximum capacity of 1.1 terabytes.

"We are building a data warehouse and a repository that will start out at a terabyte of data and could grow to two or three terabytes," says Max Ward, vice president of technology for Staples, an office supply superstore in Framingham, Mass. "We see the HP V2500 as the way to do that."

The V2500, which ships in January, starts at \$200,000 and could cost up to \$1 million.

☎ HP: (800) 637-7740

Get more online:

- One company's view on using Windows CE in industrial applications.

- Overviews of other real-time operating systems.



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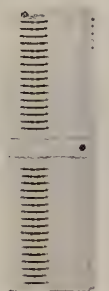
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1998 networking MVPs

Each year I pick a most valuable player in networking — the person who's done the most to further his team's

victory in the network space. Last year, it was Novell's Eric Schmidt, who continues to justify that selection, as the entire

industry now recognizes him for his efforts. This year, we have co-MVPs.

Cisco's John Strassner and Microsoft's Steven Judd are co-chairs of the Directory Enabled Network (DEN) Ad Hoc Working Group. They spent most of the year designing, refining and finally publishing the DEN specification before passing it on to the Desktop Manage-

ment Task Force (DMTF) for final review and implementation. Strassner and Judd walked a fine line between directory vendors and hardware manufacturers — each with their own biases — to arrive at a schema definition and DEN specification that not only satisfies the vendor members of the working group, but also promises to be the basis for many useful tools for network administrators.

Knowing they wanted to eventually give control to the DMTF, Strassner and Judd tried to closely follow the DMTF's Common Information Model (CIM), which is a common way to describe and share management information enterprise-wide. So when a new CIM specification was issued mid-year, the DEN working group had to scramble to redefine its specification to remain in line. That this was done with only a minimal impact on their self-imposed deadline showed the dedication that Strassner and Judd brought to the task. It's now up to the DMTF to quickly and efficiently ratify the specification so vendors can get on with the task of implementation.

I'd also like to bestow a Lifetime Achievement Award (lifetime in this sense being an Internet lifetime, about



Dave Kearns

four years) to Novell's Michael Simpson. As marketing director for Novell Directory Services (NDS), Simpson has worked tirelessly to focus industry attention on the importance of the directory to network computing. Simpson took on what was then a thankless job, as NDS promised much more than it delivered, and he shepherded the product to its position as the world's largest installed directory service, with most major vendors clamoring to climb onto the NDS bandwagon.

Well done, John, Steven and Michael. The awards are richly deserved as we head into what I believe will be remembered as the Year of the Directory.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

There's been a lot written about Open Source software recently, but the best presentation I've seen was done by O'Reilly and Associates' Tim O'Reilly and was originally published in Esther Dyson's "Release 1.0" in November. It's currently available on Gartner Group's Web site (<http://gartner5.gartnerweb.com/partners/purchase/e/df/i11/98/doc/edfi1198/edfi1198.html>). It is a must-read if you want to understand the Open Source phenomenon. Note: You will need to register to view the document.

Maximize Your Potential

Understanding TCP/IP: Implementing the Protocols of the Internet

PROGRAM OVERVIEW

TCP/IP has become the standard you must be well versed in if you work in an Internet- or intranet-centric environment. An in-depth and clear comprehension of TCP/IP is essential for network administrators, analysts and PC support staff who need to understand the practical applications of this ubiquitous protocol — not just the theory behind it.

Understanding TCP/IP: Implementing the Protocols of the Internet, an information-packed, 2-day program, is an invaluable educational tool that will help you understand the Internet protocols (TCP and IP) as well as important Application protocols. The use of over 15 case studies, captured from live internetworks, will demonstrate analytical techniques to help you solve typical problems.

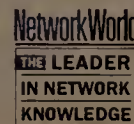
TECHNICAL HOT POINTS

This seminar will give you the opportunity to:

- Learn how TCP/IP is supported in various host and LAN operating systems
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- Understand how IP-based routing works
- Learn how you can integrate the application protocols, such as TFTP, FTP, TELNET, SMTP and HTTP into a TCP/IP environment
- Understand the operation of SNMP, the Internet standard for network management

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Briefs

■ **IBM** last week announced the Midrange Express — **pre-packaged services for small and mid-size businesses** running Big Blue's AS/400 AE servers. Midrange Express services include monitoring, help desk support, account management and daily server backups. Optional services include batch job management, disaster recovery services, performance and capacity planning, system software upgrades and a security audit offering. The services are delivered at either an IBM secure data center or via a remote link. Midrange Express services are available now.

☎ IBM: (800) 426-4968

■ **Sync Research** recently unveiled a **service-level application for its WAN management software suite**. Called ProSight, the software helps managers plan capacity, monitor service-level status and resolve trouble tickets.

The application garners data mainly from Sync's frame relay probes scattered throughout the enterprise. ProSight will be available next month for Windows 95 and NT boxes. Prices start at \$2,995.

☎ Sync: (949) 588-2070

■ **Cisco** last week shipped the Cisco 1400 series, **a line of IOS-based digital subscriber line (DSL) routers for small and mid-size businesses and small branch offices**.

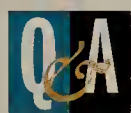
The Cisco 1401 DSL router, the first product in the Cisco 1400 series, features a 10Base-T Ethernet port and a standard ATM interface, which provides connectivity to an ATM WAN backbone. The ATM interface can be combined with an external ATM25-DSL modem, such as the Cisco 626, to provide Internet/intranet access at up to 8M bit/sec.

The Cisco 1401 router is available now for \$1,395.

☎ Cisco: (408) 526-4000

CA's Wang: Consolidation helps users

CEO says company is well-positioned to handle the Internet and management software competition.



As CEO of Computer Associates, Charles Wang has taken over many a company and, in the process, laid off many an employee. But the weight of having to make those decisions doesn't show on him.

Wang is, in short, a happy, friendly, funny guy. Before the conversation even started, he cracked a handful of jokes and then hit this reporter on the shoulder with a pen. That's what you get for handing this multimillionaire (*Forbes* estimates Wang is worth about \$800 million) a plastic pen from his show booth. With the levity out of way, Wang sat down with *Network World* News Editor Doug Barney to talk software.

How has your company adapted to the Internet?

I think the way we look at the whole Web, the Internet and so forth is a little bit different. We don't think of it as a model that stands by itself. Internet support must be seamlessly integrated into your overall IT infrastructure. Unicenter provides security, backup and workload balancing. In addition, Unicenter is Web-enabled so you can manage your infrastructure from any remote place.

"I don't think government should be dictating to software companies what they should and shouldn't develop, or what is marketable or not marketable."

Charles Wang, CEO,
Computer Associates

One of things people are struggling with as they move toward network management software such as Unicenter

and Hewlett-Packard's OpenView, is complexity. The software is very complex and difficult to install. What has CA done to make life easier for the user?

Unicenter implementation is really very quick. Where implementation consumes the most amount of time is setting up policies.

If you have very clear poli-



cies, somebody can just sit down and implement them. That's not a big problem. If you cannot get your policies together — and in a larger company, think of the politics — you're going to have a heck of a time trying to implement something.

Having made many acquisitions, what does your experience in the software market tell you about the value of consolidation in the network hardware business. Is it good or bad?

They've got to consolidate, because if they don't, what happens is there is a client base out there that's going to be left stranded. And that would be a disaster.

For example, we acquired Datacom, which was bleeding, with \$170 million in revenue and losing \$90 million a year. You have to really work at los-

ing \$90 million a year! If nobody bought that company and it decided to close up shop, big clients would be left stranded. So I think that kind of consolidation will continue, and I think it's probably good for the industry.

Have you talked at all about the Microsoft-Department of Justice situation?

I don't think government should be dictating to software companies what they should and shouldn't develop, or what is marketable or not marketable.

I don't know the specifics, and that's why we have a legal system to determine what's right and what's wrong.

What about the personal relationships among the folks who are the upper echelon of the industry. Who do you hob-

See Wang, page 24

Cabletron enters cable modem fray

By Jim Duffy
Anaheim, Calif.

Cabletron's new cable modem products are designed to let users access the Internet over cable TV networks.

The company's offerings, announced at a recent cable network conference here, include a line of cable routers for the home and enterprise, a Cable Modem Termination System (CMTS) module for the SmartSwitch Router (SSR) 8000/8600, as well as a net management application based on Cabletron's Spectrum management platform. The products are intended to utilize the existing cable TV infrastructure for Internet services such as voice over IP and video on demand.

For access from the home or enterprise, Cabletron's SSR 245 connects small-office LANs and workgroup nets to an Ethernet backbone and the Internet via a cable modem. Cabletron also rolled out the SSR 265, a Data

Over Cable Service Interface Specification (DOCSIS)-compliant router with an integral cable modem. The DOCSIS specification defines interface requirements for cable modem interoperability.

Both products offer virtual private network tunneling and encryption, firewalling, and quality of service and constant bit rate service through DOCSIS 1.1 support.

In keeping with its plan to sell Layer 4 intelligent network services to service providers (NW, Nov. 30, page 23), Cabletron's cable modem effort is focusing in large part on the SSR. The SSR is a wire-speed gigabit switching router that can prioritize applications based on transport layer — or Layer 4 — TCP and User Datagram Protocol port information.

For management of cable modem networks, Cabletron says it is developing a DOCSIS

management module for Spectrum. Through the DOCSIS management module, users can deploy Spectrum as an integrated platform on which to centralize control of CMTS, SSR 265 and multivendor cable modem and radio frequency equipment, Cabletron says.

The SSR CMTS module is priced at \$14,995 and will be available in the second quarter of 1999. The SSR 245 costs \$649 and is available now. The SSR 265 will be available in the second quarter of 1999. Pricing was not disclosed.

☎ Cabletron: (603) 332-9400

Get more online:

• Product information from Cabletron.

• White papers on cable modems.

• Cable modem product details.

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Process to manage IP addresses

Software company tries to elbow its way into an already-crowded management market.

By Jeff Caruso

Process Software has unveiled an application to handle IP address management in large networks.

As IP use has increased, so has the need for programs that can assign and keep track of IP addresses throughout a company. Network managers often keep track of user IP addresses and network devices in a spreadsheet, but that technique breaks down in a large network.

Process' IP AddressWorks lets managers change network configurations and IP addresses from a central location. It is the first part of a suite of management applications called IPworks. Upcoming IPworks offerings will manage network policies, generate reports and

manage billing, Process says.

For PacifiCare, an international health care company in Santa Ana, Calif., tracking IP addresses can be a hassle. PacifiCare manages many of its IP addresses in a central location, but some departments use Microsoft Excel spreadsheets, says Randy Carter, principal systems engineer at the Cypress, Calif., company.

"It's all hand-generated, very laborious, very tedious and quite error-prone," he says.

The company evaluated Quadritek's IP address management software but wanted capabilities in its Domain Name System (DNS) server that Quadritek didn't provide, Carter says. DNS servers map domain names to numeric IP addresses.

PacifiCare wanted software that would provide a backup server that automatically kicks in when the first server fails. It also wanted the software to work with Process' MultiNet DNS for OpenVMS. Process' new IP AddressWorks software has both capabilities, Carter says.

All of the Process applications are designed around directories that use the standard Lightweight Directory Access Protocol (LDAP). Through LDAP, the software can retrieve and change configuration data about devices in the network.

The IP address management market is already somewhat crowded. Players include Quadritek, now owned by Lucent; American Internet, now owned

by Cisco; and MetaInfo, a subsidiary of CheckPoint Software Technologies.

"I could see Process getting bought. It'll be interesting to see how long it stays independent," says Eddie Hold, an analyst with Current Analysis in Sterling, Va.

He points out that 3Com and Xylan might want to acquire IP address management capabilities. Both companies work with Quadritek, but Hold speculates that those agreements might change because their rival Lucent bought the company in October.

IP AddressWorks will ship in the first quarter of next year on Windows NT, OpenVMS and Unix, starting at \$2 per node.

☎ Process: (508) 879-6994

Wang

Continued from page 23

nob with, and how do you keep in touch with some of these people?

I enjoy being with Bill [Gates]. He's a good guy. I also like Scott [McNealy].

But I don't think we really hobnob. I probably have the same kind of talent in my own organization.

It's great to have a great relationship on top, but if you don't connect through the ranks it doesn't matter.

You can have the greatest relationship in the world, but nothing will ever get done.

What motivates you?

You have to do things with your life; you've got to build something.

I love to watch my people grow and build something — something that's going to have some value. ■



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INTERNETWORKING MONITOR • ATUL KAPOOR

Frame relay faces strong challenge from VPN technology

Frame relay has been one of the hottest WAN technologies over the past five years. The promise of cost savings versus leased-line networks, easy implementation, de facto outsourcing of the WAN and better performance than earlier digital loop carrier protocols made migration to frame relay a no-brainer.

Frame relay's growth likely will continue unabated in the foreseeable future, but a strong alternative is beginning to show up in the form of Internet-based virtual private networks (VPN).

Internet-based VPNs provide a lower cost and more ubiquitous access than frame relay, albeit at a lower quality of service (QoS). ISPs are working hard to provide a more predictable QoS for the Internet. As Internet services narrow the

QoS gap, frame relay service providers must tackle a number of issues in order for frame relay to remain a leading-edge technology.

One common customer concern is frame relay service-level agreements within a single-provider service and on an end-to-end basis when multiple service provider networks are involved. The scope of SLAs, such as a customer's ability to measure and enforce the SLAs, still remains problematic.

Frame relay has also lagged in its ability to

provide higher speed access links. Today, as a large number of customers are looking for OC-3 or higher speed access, frame relay services are introducing T-3/E-3 speed access.

For multinational enterprises, frame relay access continues to be a problem. In terms of its reach, frame relay will per-

haps never attain the ubiquity of the Internet. Beyond universality, provisioning a multinational frame relay service still remains complex and time-consuming, especially when com-

pared with Internet-based VPNs.

While voice over IP and multimedia are hot Internet applications, they remain peripheral issues in frame relay. Multiservice frame relay — meaning the ability to seamlessly handle voice, video and data — is nonexistent.

In frame relay network management, customers are demanding better tools from service providers. Here again are users only beginning to see detailed and timely management reports in written, easy-to-use formats.

Capacity planning for frame relay PVCs continues to be an art. Switched virtual circuits (SVC) can certainly ease the job of determining virtual circuit capacity.

However, despite an SVC implementation agreement

published by the Frame Relay Forum more than three years ago, SVCs almost universally are still a "planned" feature from most service providers.

These limitations and the emerging popularity of Internet VPNs do not sound a death knell for frame relay. Frame service will continue to remain a major technology. Higher speeds, better SLAs, more extensive management tools and multiservice nets will evolve, though not at the pace most users desire.

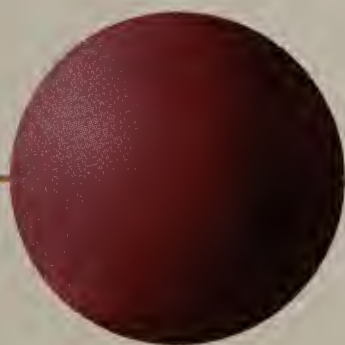
Frame relay is a service primarily provided by telephone companies, which are not exactly known for their agility in responding to user needs. Competition is good for them. The Internet is a big gorilla and may shake the telephone companies into moving a little faster.

Kapoor is managing director of The Tolly Group in Manasquan, N.J. He can be reached at akapoor@tolly.com.

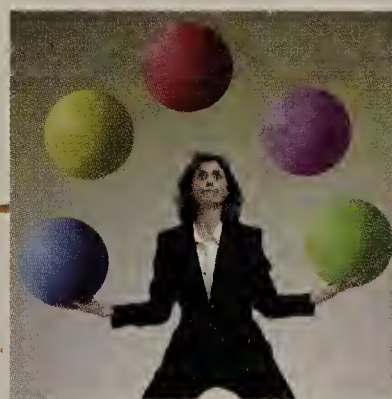
Frame relay's growth likely will continue unabated in the foreseeable future, but a strong alternative is beginning to show up in the form of Internet-based virtual private networks.



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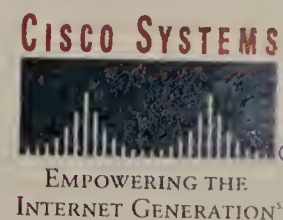
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The browse function presents a list of NetOp Host PCs in the network.

View controlled PCs windowed — or zoom in for a full screen view.

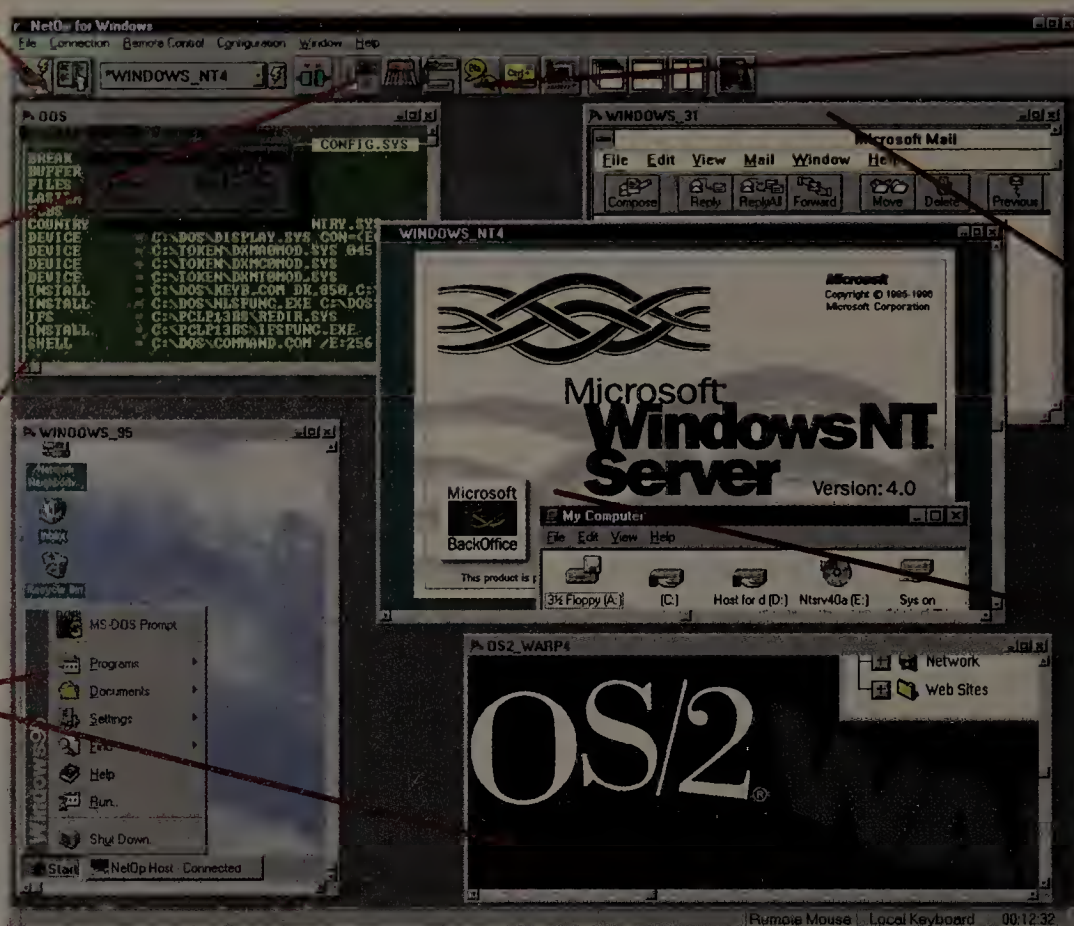
Backwards compatible. Can remote control earlier NetOp Host versions on your network.

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Briefs

■ Shortly after replacing its CEO, competitive local exchange carrier **E-spire Communications** has taken another step to **shore up the company.**

E-spire says it will stop reselling Bell-company switched local services, except in cases in which customers have at least one office directly on E-spire facilities and need to connect other offices via resold loops.

E-spire previously used Bell resale to build market share, but new CEO Anthony Pompilano says the result was low profit margins after paying Bell wholesale prices.

■ Wireless start-up **WNP Communications** of Reston, Va., is **adding** two former American Personal Communications/Sprint Spectrum **executives**, Barclay Jones and Mark Emery, to its management team. Barclay is now WNP's vice president of engineering, and Emery is WNP's vice president of operations. WNP, the biggest Local Multipoint Distribution Services license bidder in the Federal Communications Commission's auction earlier this year, is expected to offer LMDS-based services late next year.

■ **Internet2**, the high-bandwidth IP network for research universities, is getting a boost in the Northeast. IXC Communications, Applied-Theory Communications and Newbridge Networks are working with **NYSERNet 2000** to connect Columbia University and New York University via a new Giga point of presence. The POP, which is expected to be complete by early next year, will let users send IP traffic over an ATM OC-12, 622M bit/sec backbone. The New York Giga POP will also connect to the mid-Atlantic crossroads (MAX) Internet2 Giga POP via a dedicated OC-3 link. The MAX Giga POP links Georgetown University and George Washington University.

AT&T Labs cookin' up a voice and data mix

Project aims to mix traditional phone service with packet-switched networks.

By Sandra Gittlen
Florham Park, N.J.

On the walls of AT&T Labs' hallways are old photographs of the first trans-Atlantic phone call, five generations of Alexander Graham Bell's family and other reminders of AT&T's illustrious history. But behind every door is a researcher racing to figure out how to move the telephone giant from the circuit-switched world into a packet-switched one.

For all their efforts, though, even Larry Rabiner, AT&T Labs vice president of research, says the migration from circuit-switched to packet-switched nets is years away.

"We can't just abandon the plain old telephone system for IP," Rabiner says. "There first has to be a merging of the two networks."

Rabiner has charged his staff of more than 2,000 researchers with figuring out a way to protect the company's century-long investment in the traditional phone network while at the same time taking advantage of the benefits of packet-switched networks, such as lower equipment costs and no regulatory fees.

Two of the hottest research projects underway at AT&T Labs' location here — Telephony over Packet Switching (TOPS) and Wireless Integrated Services Protocol (WISP) — are designed to exploit packet-switching benefits.

Starting at TOPS

TOPS defines a network architecture that lets enterprise users contact one another without having to figure out each others' phone numbers first. Instead, people can use simple voice commands, such as "Call Chuck."

With TOPS, phones would be connected over a packet network to a directory server that houses profiles for each user and uses AT&T Labs' speech

recognition software to understand voice commands. The server could be at a corporate site or remotely managed by a service provider from its network. User profiles contained in the directory would include cellular, work and home telephone numbers, along with information on the best times to reach users and the best methods by which to reach them. Profiles could be changed on the fly by network administrators or users.

mented for four to five years. However, Mishra says pieces of the project have been adapted for current AT&T services.

WISPing away

Another Mishra and Sreenan collaboration, WISP, combines voice and data across wireless LANs.

Bluetooth, a similar project supported by Ericsson, IBM, Intel, Nokia and Toshiba, lets users connect devices, such as

device, which is outfitted with a telephone receiver, a wireless LAN interface card and a 48M-byte Linux-based flashcard, hooked via radio waves to an Ethernet base station located nearby.

The base station, or hub, is connected to the LAN over an ATM backbone. A building could have base stations peppered around its floors. If a user moves out of one base station's geographic range, another base will pick up the handheld's signal and become the user's master base station.

Developing the technology was tricky, Mishra says, because voice has a higher quality-of-service (QoS) requirement than data and, therefore, its packet delivery needs to be scheduled. With WISP, voice calls reserve the bandwidth they need when the call is established. The base station acts as the arbiter of traffic, deciding which packets get priority.

Mishra says the project works well in-house, but moving it outdoors could be challenging. "There isn't as much bandwidth available as the technology needs," he says. WISP is about five years from being fully implemented, Mishra says.

Although TOPS and WISP still have a ways to go, Rabiner says the migration to combined voice and data networks will happen sooner.

"We need to create intelligent services based on telephony," he says. "But the services available today are a world apart from each other. We need universal broadband access from any device. Remember, there are 290 million phones in use today and they aren't going anywhere." ■

PROFILE: AT&T LABS

Director: Larry Rabiner, vice president of research.

Located: Florham Park, N.J. (also has offices in Silicon Valley).

Founded: In 1996, after the breakup of AT&T.

Hot projects: Telephony over Packet Switching, which allows enterprise users to call one another using simple voice commands rather than phone numbers; the Wireless Integrated Services Protocol project, which allows users to move workstations without needing to reconfigure desktops; the Watson speech recognition project; DjVu image compression; and Cospace, which hooks Web pages to virtual worlds and allows Web site visitors to view supplementary 3-D content and chat with one another.

Employees: More than 2,000 researchers.

Fun fact: The phone system that allows a user to say "collect," "calling card," "third-party billing," "person-to-person" or "operator" and then processes a person's voice response was developed by Rabiner and a team of researchers at AT&T Labs.



Larry Rabiner



Information on the party being called would be sent to the caller's phone. If the party being called is not on the packet network at the time, TOPS would connect the call over a public switched telephone network via a gateway.

TOPS, which was developed by AT&T Labs researchers Cormac Sreenan and Partho Mishra, will not be fully imple-

mented for four to five years. However, Mishra says pieces of the project have been adapted for current AT&T services.

With WISP, users would be able to relocate their phones and PCs anytime without having to fuss with rewiring and reconfigurations.

The WISP network prototype features a modified handheld

Get more online:

For more on AT&T Labs and other research facilities around the country, head to Network World Fusion.

www.nwfusion.com

WAN MONITOR

The fine art of device integration

Key announcements lately are underscoring the convergence of telephony with data, and just about everyone is getting into the act. Access

vendors such as Cisco and Ascend have been pursuing telephony integration initiatives for some time, and now smaller companies with mass-market customer

premises equipment (CPE) are jumping into the game.

At the recent Western Cable show, various announcements and technology demonstrations showed how cable providers are going to put packet-telephony features into access devices.

For example, Broadcom announced a new chipset that combines cable modem capabilities with IP telephony and videoconferencing functions. Broadcom supplies chips to many of the leading cable modem and set-top box providers.

Motorola demonstrated a voice-over-IP-capable cable modem, and is teaming with Netspeak to bring IP telephony across all of Motorola's access platforms.

The cable vendors are talking about selling these \$200 devices with almost no markup.

Digital subscriber line (DSL) vendors are getting into the act, too. Expect to see a slew of DSL modems and routers soon with IP telephony inside and RJ-11 ports on the outside. JetStream has just announced ATM-based Integrated Access Devices that reside at subscriber premises.

These boxes connect to a DSL circuit and provide integrated local telephone connectivity and Internet service via an Ethernet connection. Other such products are coming shortly.



In addition, some preliminary announcements from Sprint and MCI WorldCom indicate these carriers are going to use those devices in ION and OnNet, respectively.

Is the network ready for this sort of integration, and will business users trust their voice applications, including mission-critical ones, to such centralized products and services?

Our response: Why not?

You see, many of these packet- and cell-based options have gotten a bad rap from users who have had terrible Internet voice experiences.

In those instances, the voice packets hopped from switch to switch, inserting latency, dropping packets and creating other problems in the process. The result was poor voice quality.

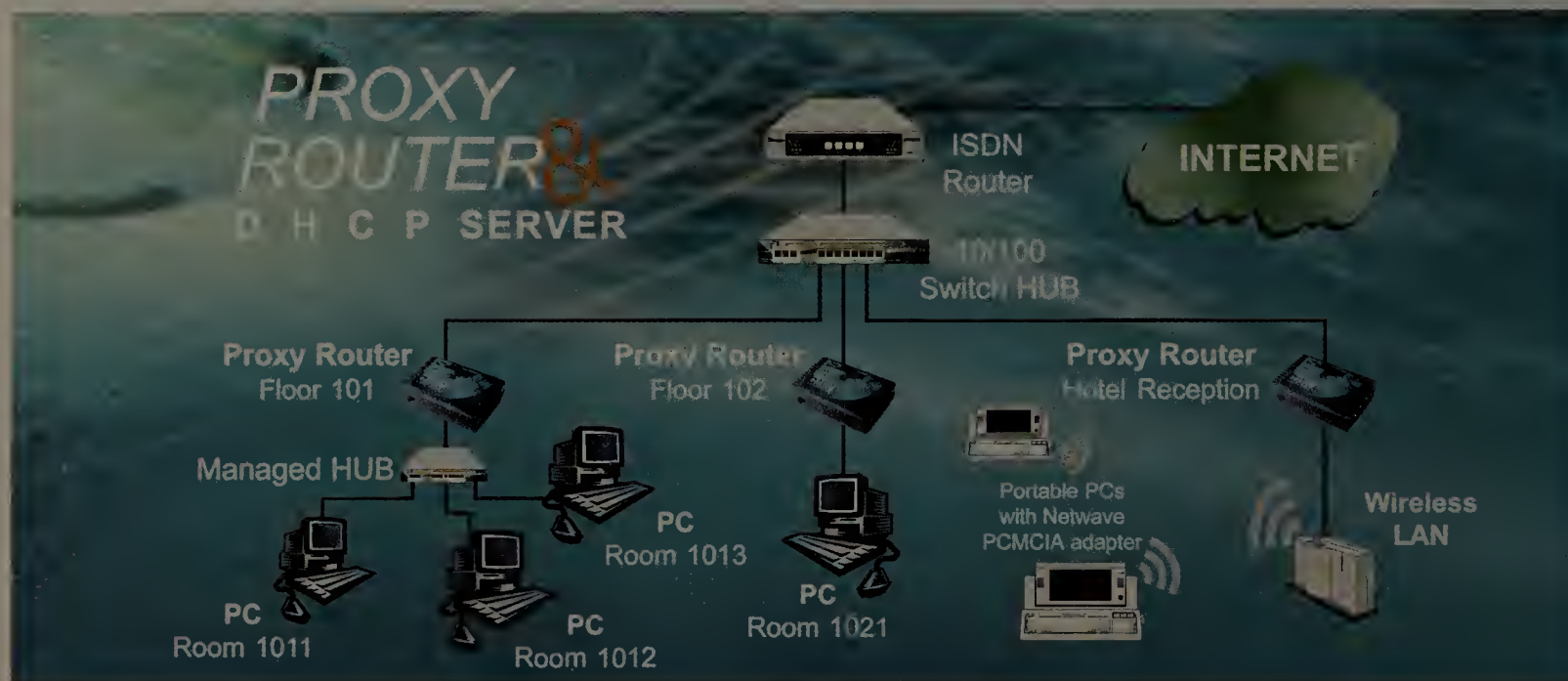
Businesses have been deploying CPE to get toll-quality voice over frame relay and ATM for years.

Whether the single provider service is based on IP, frame relay or ATM, the key to high-quality communications for now is a single provider controlling the network.

With one service provider, the end-to-end service performance is more easily controlled than under Internet conditions.

Briere is president and Heckart is vice president of TeleChoice, a consultancy in Boston. They can be reached at dbriere@telechoice.com and heckart@telechoice.com. Eric Zines, a TeleChoice analyst, contributed to this column.

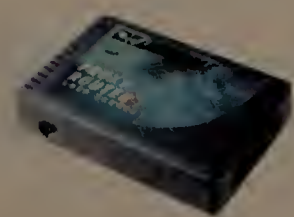
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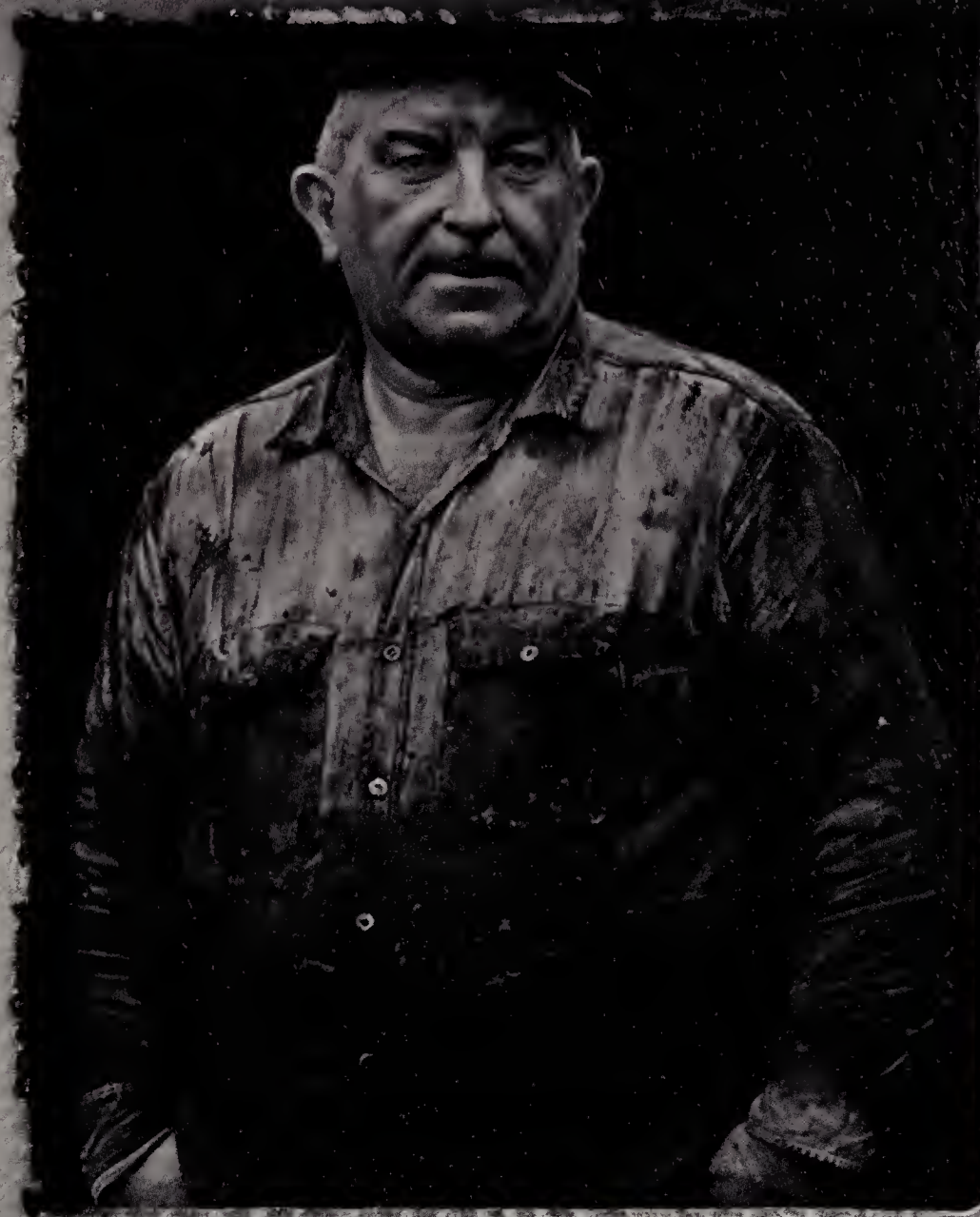
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HOW TO KEEP A SECRET.

In transforming your business into an e-business, the single most important issue you have to wrestle with is the issue of security.

Without flexible control over who sees what information, all the benefits of putting your key business processes online (which is, after all, the definition of an e-business) are a moot point. And when you connect your critical systems to the Web to help you improve customer service or increase the efficiency of your organization – security is a white-knuckle issue for the people charged with keeping your systems running and your data protected.

It's not just a matter of whom you let in and whom you keep out (although that is obviously important). When you're using the Web (or an intranet) to do things like let your employees change the asset allocation of their 401(k) accounts or let your customers see what their credit balance is, you need the ability to determine who sees what and who can make changes to what they see.

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Call center migration

Call centers grab for Web

But questions remain about adding real-time voice and prioritizing e-mail.

Dollar Bank in Pittsburgh, in the late 1970s, was the first financial institution east of the Mississippi to implement automatic bill paying by phone.

So you'd think the \$2.6 billion financial institution would be among the first to implement Internet banking and link it closely to live customer service. Well, it is . . . up to a point.

The bank was an early purchaser of Edify's Electronic Banking System, a Windows NT 4.0 server system that presents customer account information on a bank's Web site. And the bank has integrated its Edify Web banking service, called NetBanking, with its interactive voice response (IVR) phone banking service.

Not only that, e-mail messages sent from the Web site are routed to a call center agent who makes certain the customer gets a response.

But there's one thing customers can't do on Dollar Bank's NetBanking system: click on a call-me button to have a call center agent call them back live to answer their questions. Although a user could jump off Dollar Bank's IVR system to a live operator, bank officials don't want to assume customers have a second phone line to provide a simultaneous voice connection with their Web sessions.

And the officials are skeptical about special hardware and software that would interleave voice traffic over the customer connection to the NetBanking Web server via a single phone line.

Don Beacom, the bank's manager of Internet applications, once tried such a single-line call-me system. "But I didn't think that the quality of that connection was very good," he says. And he's worried that he would have to pay for more access bandwidth to accommodate such a converged application.

Trend shift

Dollar Bank's experience illustrates the dilemma of many of today's early implementations of Web call center integration.

The technology generated a burst of enthusiasm from vendors about a year and a half ago that resulted in a slew of first-generation call me products from PBX manufacturers and independent software vendors. But now the trend is toward the more mundane concern of how to get call centers to begin to deal with non-real-time Web responses such as e-mail.

"A lot of people think of [Web call center integration] as the call me button. That's a very small piece of the market right now," says

By David Rohde

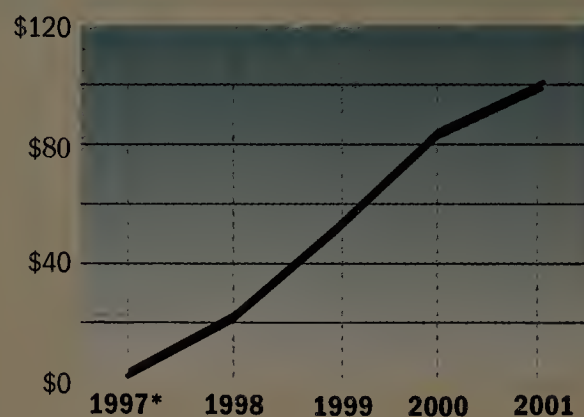
Francisco Kattan, senior product manager for call center marketing at Edify in Santa Clara, Calif.

Today, observers agree, most companies give users the option to send inquiry e-mail over their Web sites, but from there the link between the Web site and the customer service call center is broken. Either the customer service agents receive the e-mail inquiries in a vacuum or the mail goes to an entirely different part of the company, sometimes to languish for weeks

THE STRUGGLE TO BE RESPONSIVE

Expected growth of Web response software, which organizes e-mail similar to how call centers organize incoming phone calls for sales and service:

Projections of U.S. e-mail Web response software revenue (in millions)



Note: Revenue for stand-alone software products only. * Actual revenue
SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

on end or die unanswered.

Several highly publicized tests have highlighted corporations' inability to deal with Web site-generated e-mail. But Kattan says the real problem is not network administrators' competence or attitudes.

It's just that they can't afford two platforms — one for call centers accustomed to dealing with calls immediately and another for electronic commerce development teams not used to strict standards for customer response.

That's a problem Edify's Electronic Workforce, an application development and run-time platform for Windows NT, attempts to address.

"You build Electronic Workforce for either the Web or the telephone system," Kattan says.

"You get to pick. You do integration with the back office once. You do business rules once."

To advance the application-generation work for certain markets, Edify offers two industry-specific variants of Electronic Workforce: the Electronic Banking System for financial institutions and the Employee Service System for large human resource departments.

E-mail as an 'event'

Edify's Electronic Banking System does include an optional call-me button, though to use it the customer must have a second phone line or disconnect from his computer before the call is placed to the call center. Many vendors say the call-me button is key, especially for financial institutions that don't want to be obligated by what a call center agent might write in a casual message.

"Large financial institutions don't want to respond to e-mail in writing because of the liability," says Dan Keshian, president of WebLine Communications in Burlington, Mass. "They want to queue it up with an agent and have the agent call back."

WebLine 2.0, introduced last June, is a Java application that, when downloaded to a customer, connects the customer to a collaboration server shared by the agent. The user and the agent are then able to share screen displays, co-navigate the Web and collaborate on shared forms.

WebLine also offers a feature called Media Blender, which integrates e-mail into the priority system established by call centers via their automatic call distributors (ACD). An ACD works on the principle of

treating an incoming 800 phone call as a red alert, searching wherever it can for a free agent to take the call.

Media Blender extends the principle to e-mail as well as other possible methods of customer contact, such as fax.

It's also important to decide exactly where to place the call-me button, Keshian says. It's a mistake to place it on your home page or many other Web pages, he says, because call center labor is expensive and most companies can't afford to tie up agents' time with idle questions from people who are not likely to buy.

Instead, Keshian says to place it well into the e-commerce application only for qualified customers, or pop up a dialog box asking if the customer wants to be called. ■

Intranet Applications

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Briefs

■ **SkyCache** last week announced that its satellite-based caching service is compatible with **InfoLibria's DynaCache Web caching Web server.**

Unlike traditional caching methods, which use TCP/IP, SkyCache 1.0 beams a datastream via satellite broadcasts to load fresh content onto its customers' caching appliances. Release 1.0 is a monthly service. The DynaCache Web server supports all flavors of Ethernet and SONET.

☎ SkyCache: (301) 598-0500; InfoLibria: (781) 398-0288

■ **Kana Communications** of Palo Alto, last week added oomph to its high-volume Web site e-mail manager with **Customer Messaging System 3.0.**

The upgrade includes a direct marketing module called Kana Direct; a feature called Kana Link that allows customers to integrate the Kana tool with their existing e-mail servers and clients; and Kana Classify, an automatic response function that analyzes message content and either replies itself or routes the message to an employee.

The starting price for Customer Messaging System 3.0 is \$39,500.

☎ Kana: (650) 325-9850

■ **Axent Technologies** has begun shipping **Defender 3.0, software-based authentication token technology** that let users generate one-time passwords that are checked against the Defender Security Server.

Defender 3.0 lets managers remotely distribute each user's token to his individual machine automatically over any network, eliminating the need to install the software from individual diskettes. Pricing for Defender 3.0 starts at \$1,995.

☎ Axent Technologies: (301) 258-5043

Tools harness Web project teams

Interwoven TeamSite and Oracle WebDB give Web site development backbone.

By Robin Schreier Hohman
Palm Springs, Calif.

Let's face facts. First, a Web site is made up of hundreds of files. Second, it takes more than one person to create a large site. Third, everyone has their favorite HTML editor. These facts add up to problems for managing Web development.

Two new Web site management tools promise to take the sting out of tracking the jumble of documents, GIFs, Common Gateway Interface scripts, HTML pages — and developers — it takes to maintain a large Web site.

Interwoven has just released a major upgrade to TeamSite, software that creates a file system to organize a large Web site. Oracle is pushing a specialized database, called WebDB, that stores and manages the files that make up a Web site and information about user access rights.

TeamSite is a server application that gives you a graphical way to control and access the underlying file system of a Web site. It allows for version control, multiple users and distributed collaboration.

Teamsite also handles the

often neglected task of archiving an entire site. This is an area that deserves more attention: It's just a matter of time before an unhappy surfer sues a company over something on a Web site. A computer date-stamped archive could be useful in defending against such a suit.

Interwoven's approach is likely to win fans among developers because it doesn't require users to give up their favorite editing tool. Because TeamSite is server-side only and users access the files through a browser, they're free to continue using their development tool of choice, on their platform of choice.

"Interwoven isn't trying to be the Web site development tool," says Mike Gilpin, an analyst at Giga Information Group. Instead, it is aiming to establish TeamSite as the framework underlying a Web site.

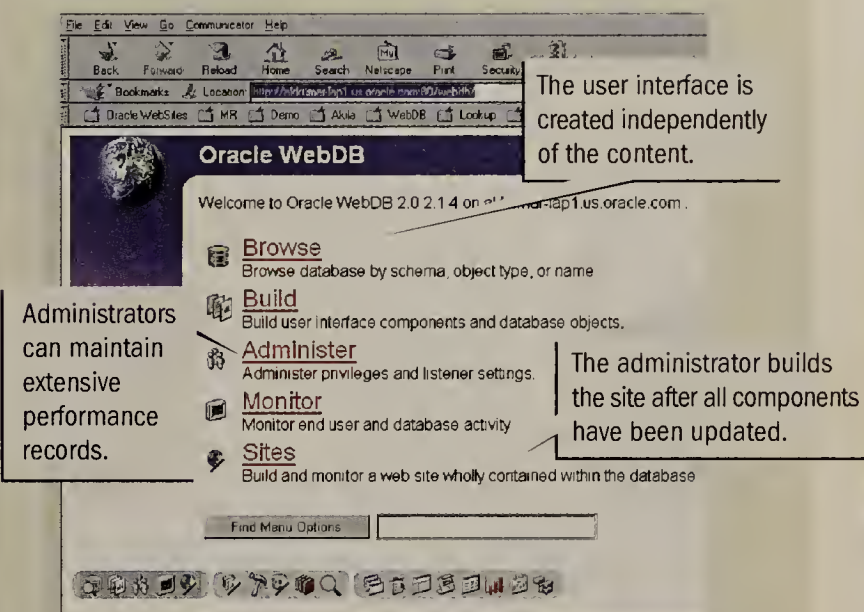
That's one reason Nortel Networks chose it. "It allows tracking of documents in a familiar file system [Unix] and works with all our Web publishing tools," says Tim Chandler, Nortel's director of strategic Web business.

Chandler, formerly of Bay Networks, says his team at Bay

TAKING CONTROL OF YOUR WEB SITE FILES

Interwoven's TeamSite and Oracle's WebDB help developers get a handle on the myriad files that make up a Web site by bypassing the personal Web server and leaving all the files on a common server. TeamSite creates a framework for all your files and lets users work on the same document at the same time. WebDB integrates with Oracle's 8i relational database to create a Web site development environment.

Oracle's unreleased WebDB organizes all site files in a database:



began using TeamSite in October 1997, before the company was acquired. Prior to that, the team used FTP to send the

files to the Unix server. TeamSite allows people at different locations to work on the Web site.

Version 2.5 of TeamSite includes support for Lightweight Directory Access Protocol and runs on Windows NT and Sun Solaris. Pricing is \$40,000 for the software and between \$500 to \$4,000 per user seat. The product is shipping now.

The power of Oracle's WebDB shines when you want to query the database for performance tracking.

WebDB is currently in beta and is expected to ship in February. Pricing hasn't been determined. ■

QUICK TAKE: NET-IT CENTRAL 3.0

Allegis adds XML to intranet publishing tool



Allegis Corp., formerly Net-It Software, has just shipped Version 3.0 of Net-It Central. Net-It Central is a departmental-level intranet document publisher. The upgrade lets users publish to an intranet through a browser.

Version 3.0 also adds limited Extensible Markup Language capabilities and uses XML to publish metadata about a document, making keyword searches and indexing easier. XML may also become the display platform.

Net-It Central runs on Windows 95, 98 and NT 4.0. It costs \$9,995 per server and includes a license for unlimited users. Priority users can access the upgrade for free electronically; it will cost others \$4,000. Allegis will ship copies with documentation by month's end.

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NET INSIDER

Why can't we all get along?

I'm writing this column in a bright pink hotel near Walt Disney World on the Sunday between the 43rd Internet Engineering Task Force (IETF) meeting

and the International Telecommunication Union technical standards group's (ITU-T) IP Telcom meeting.

In the spirit of cooperation, the ITU-T

scheduled its meeting for the week after the IETF event and held it in the same hotel so people could attend both meetings. Cooperation between the growing number of standards bodies dealing with different aspects of the Internet protocol suite was one of the topics of conversation at the IETF meeting and promised to be a big issue at the ITU-T gathering.

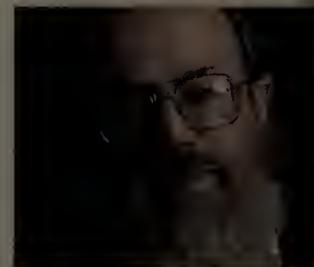
Just about all the work done by the IETF and World Wide Web Consortium (W3C) is Internet-related and has been for years.

For other groups, the Internet has been a sometimes important issue but often a peripheral one. Among these groups are the ITU-T, which has been working on H.323 and other IP telephony standards for the past few years, and the International Standards Organization (ISO), which has been working on Internet routing standards.

With so many people focused on the convergence of voice, data and video traffic onto IP networks, cooperation between standards bodies has become an ever more important concern.

At one level, cooperation between standards bodies can be easy. As the W3C's Jim Getties put it during the IETF plenary when the issue of cooperation came up: "Them is us." In other words, many IETF attendees regularly participate in other standards groups.

But many standards groups are nervous about such cooperation. That's because it can be hard to tell if an opinion or proposal represents another standards body's official stand or is just the opinion of an individual.



Scott Bradner

The IETF has issues with receiving official communication from other standards groups, because we at the IETF treat everything as if it comes from individuals and give no additional weight to official statements.

The IETF has come a long way in the last five years on the cooperation front.

Fred Baker, the IETF chairman, received one of the biggest rounds of applause during the recent meeting's plenary session when he mentioned how well the IETF and ITU have been working together. Cooperation can be a good thing if both sides understand how to do it, which the ITU does. For example, the ITU and IETF were able to agree on a single Internet fax standard. However, working together is not a panacea. There are times when the underlying architectural assumptions of the two groups are so different there is no way to agree on a single approach. In these cases, the marketplace must be the final arbitrator.

I do not expect that working out the balance between turf and cooperation will be easy, but it is important, and it will be an ongoing issue and occasionally will become quite a bitter one.

Disclaimer: Harvard, like many universities, has been defined as a turf battle over parking spaces being fought under a common name. But the above battle has nothing to do with Harvard.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

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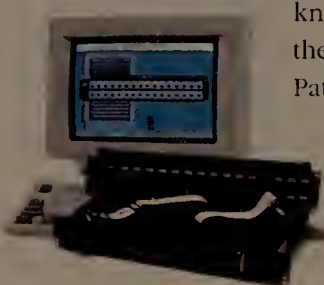
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My company is looking at implementing Linux as an alternative to Windows NT or NetWare. Because there are several different Linux versions available, I am concerned about which is the best one to use. Do you have any suggestions?

Via the Internet

Unless you have the time and talent within your department to get things up and running, going with one of the commercially available versions of Linux may be your best option. One important point to consider is the availability of support when you run into a problem that can't be resolved by reading the manual or consulting one of the Usenet newsgroups that addresses Linux.

There are two primary commercial versions of Linux. One version is from Red Hat Software (www.redhat.com), and the other is from Caldera Systems (www.caldera.com). I checked out both companies' Linux products at NetWorld+Interop 98 in Atlanta and found that Caldera's offers more network connectivity options. It is the only version I've found that offers native connectivity with NetWare 4.0 and 5.0 using Novell Directory Services.

Available from Caldera's Web site is Linux for NetWare. This is an add-on to the Linux version currently shipping that makes the system appear to network clients as a native NetWare server.

If there is a situation in which you need to migrate from Linux to NetWare or need to make Linux systems appear seamlessly to the clients without adding additional user software, Linux for NetWare is an attractive option.

Balancing the TCP/IP load

By Ron Suci

A current challenge facing many network administrators is how to make their TCP/IP applications scalable and keep them available for users.

In today's marketplace, it is imperative that Web applications, telnet 3270 servers and batch file transfers are up and running at full capacity.

When there were problems with Web application's availability and traffic-load capabilities, early fixes were often imple-

an IP data bit that indicates the length of time that an IP datagram can be forwarded to other routers before it is discarded.

As a result of IP address caching, the load-balancing function provided by the DNS server is bypassed, and the client continues to use the cached IP address instead of trying to reconnect. This results in a hot spot where an overutilized server continues to get additional connections.

Round Robin DNS has fur-

The simplest method is to use the redirection function of HTTP. Here, the load-balancing application uses HTTP to redirect the requesting client to a particular server within the cluster.

There are, however, several significant disadvantages to this technology. Only HTTP — Web — traffic is load balanced. Additional network traffic is generated to redirect the requesting client to the server. Bookmarking the URL returned after redi-

flow through the LBS, scalability can be limited based on how incoming packets are processed by the LBS. Some load-balancing applications use Network Address Translation (NAT), which modifies the source and destination IP address of the packet. The additional processing significantly increases the overhead of the incoming packet processing.

In many cases, the volume of outbound server-to-client traffic is substantially greater than the inbound traffic. For example, when you download Web page HTML and embedded images from a server, the outbound request is much smaller than the incoming images. Typically, images from the World Wide Web are at least 10 times the size of the client URLs. By utilizing NAT, additional processing is needed, significantly increasing the overhead of the incoming packet and forcing the server response to also flow through the LBS. This could potentially cause a bottleneck in the network.

Ideally, incoming packets for local servers should flow through the LBS with little or no packet manipulation and should require no proprietary agents in the servers. The outbound server responses should bypass the LBS and flow through a separate bandwidth connection.

Another key feature of any load-balancing scheme is the ability to tailor load-balancing algorithms to the applications. For example, balancing TN3270 servers is different from balancing Web servers.

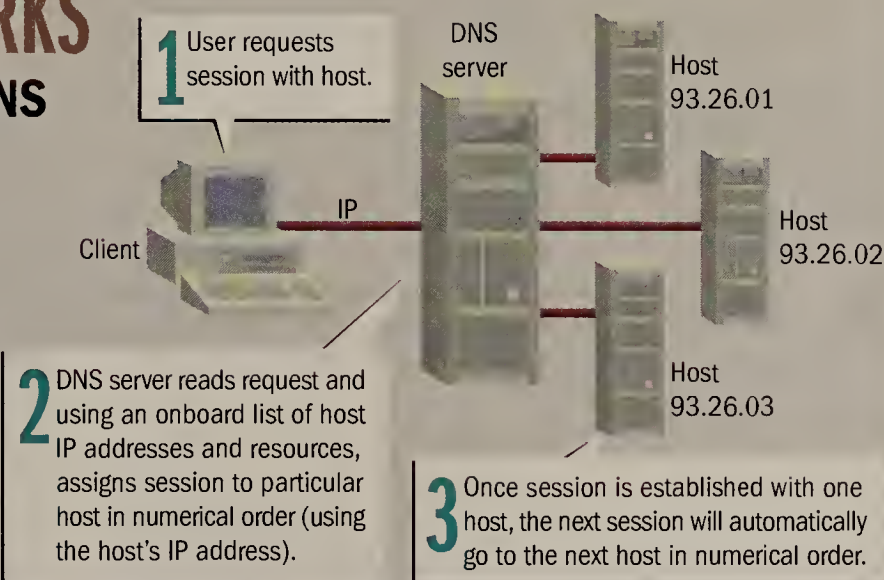
Scaling TCP/IP applications will be a critical success factor for network administrators. If handled incorrectly, users will be forced to deal with slow response time or refused connections. In today's competitive market, network administrators must ensure their load-balancing solution is protocol-independent; scalable; highly available; able to accommodate various server capacity; and able to support any server platform from PC to mainframes.

Suci is a senior technical staff member at IBM. He can be reached at (919) 543-8595 or suci@us.ibm.com.

HOW IT WORKS

Round Robin DNS

TCP/IP traffic load balancing can come in many forms. One of the most popular load-balancing technologies is called Round Robin DNS. The idea behind Round Robin DNS is to distribute session loads amongst servers with identical content, spreading out the workload and providing some session failover capability.



mented at the Domain Name System (DNS) server, where host names are translated into IP addresses.

One of the most popular methods of load balancing is a technique called Round Robin DNS. With Round Robin DNS, the DNS server selects servers with similar content, each having its own IP address, and rotates through those addresses as session requests come into the DNS server.

Round Robin DNS has the advantage of being transparent to the client and servers. It is also executed only once, at the start of the transaction. Unfortunately, Round Robin DNS is often unsuccessful because intermediate name servers and client software, including popular browsers, often cache the IP address returned by DNS or ignore the time-to-live (TTL) value. TTL is

ther limitations because it does not have the ability to differentiate by port, has no awareness of the availability of servers and cannot take into account existing workload on servers.

To remove the limitations of DNS load balancing, several other methods of TCP/IP load balancing have been developed. With these configurations, a separate load-balancing server (LBS) is placed in front of a cluster of servers. Name resolution requests are then sent by DNS to the LBS.

That allows the cluster of servers to have a single IP appearance, thus removing any dependence on DNS for load balancing. The servers' single IP address is called the cluster address.

Once the connection request is received at the LBS, there are several ways to direct the request to an appropriate server.

rection will bypass load balancing on future connections.

A more flexible approach is for the LBS to inspect all incoming packets to the cluster address. The LBS examines the IP header of each packet sent to the cluster address to decide whether the packet belongs to an existing connection or represents a new connection request. If it's a new connection request, the LBS performs the load-balancing operation to determine which server to forward the request. If the packet is from an existing connection, the packet is forwarded to the same server chosen on the initial connection request.

These offerings can load balance HTTP or FTP traffic, as well as other standards-compliant types of TCP and User Datagram Protocol (UDP) traffic, including TN3270.

Because all incoming packets



Virtual pets for virtual boys and girls

Ho ho, and, if you'll allow me to say so, ho. 'Tis the season to be jolly, they tell me. You spend a Christmas with my in-laws and then remind me again. But rather than brood about the inevitable family reunion, I've been thinking about toys for my loved ones.

Last year the hot toys were Tamagotchis. This year it's the lovable Furby, seen more in the press than in the toy stores. (Fun Web site of the month is the Furby autopsy page: www.phobe.com/furby/.) Both of these hit toys are virtual pets — machines that exhibit characteristics of real pets, such as a need for attention and a penchant for interaction with the owner.

They say that the difference between men and boys is the price of their toys. I think it must be true because I have a virtual pet, and it cost me thousands of dollars. I bet you have one, too. It's your very own computer.

I bought my first computer in 1991. I'm still using the original case, but everything else has been upgraded many times. I'm on my second power supply, my third CPU and my fourth disk drive. I fondly remember the many keyboards, video adapters and monitors that once graced my desk. Let me pause a moment to recall the ghosts of peripherals past.

I'm just as bad as my 5-year-old son, who comes home from Grandma's singing the commercials for toys he likes. In my case, I read the computer publications and go home and tell my wife about the cool products I'd like to try. She treats both of us the same way, with a tolerant, "That's nice, dear. Now go away unless you want to help me fold these clothes."

My son just shrugs it off. He has yet to enjoy the monetary benefits of regular employment. I, on the other hand, go out and beg for or buy what I want, then huddle in my home office dismembering my hardware and putting it together again in a new, improved form. Sometimes I let my son use the screwdriver. I know my computer appreciates the treats it gets, such as the cable modem and TV/video adapter.

What's the cure for this unhealthy attachment to a machine that can't love me back? Maybe it's time for me to get a dog. After all, I only have three already, and they're small. Maybe I should upgrade to an Irish wolfhound.

Happy holidays, and I hope you find 32 megabytes under your menorah or in your stocking.

Lee Schlesinger, test center director

lschlesi@nww.com

M a n a g i n g p e o p l e • W i l l i a m C o h e n

Eight universal laws for becoming a great leader

In networking as in other fields, there are many well-educated and motivated people who lack knowledge of how to lead others. So they don't assume leadership positions, or if they do, they don't do very well in them.

These people (and others around them) assume they just weren't born to be leaders.

That's really a tragedy, because our country needs good leaders. Corporations, associations and classrooms all need good leaders. Even parents must be good leaders or their families can become dysfunctional. It is hardly an exaggeration to say that our very success as a nation depends upon good leadership.

In reality, effectiveness as a leader depends not on some trait you are born with but on specific principles that anyone can follow. I call them The Eight Universal Laws of Leadership.

● **Maintain absolute integrity.** Leadership is a trust. If others don't trust you completely, they will not follow you in every instance. Instead, they will try to decide, based on the situation, whether to follow you or not. If the environment you are in is relatively calm, you may be able to lead without too much difficulty. But if your situation requires you to make real demands on others, at a time when you must really depend on them, lack of complete trust will make them hesitant to support you.

● **Know your stuff.** You must show others that you're competent and know what you're doing. Office politicking may get you promoted, but it won't win the respect of those you want to follow you.

● **Declare your expectations.** You can't get there until you know where "there" is. Decide what you want to achieve and then continually promote your goals, objectives and vision.

● **Show uncommon commitment.** You can bet no one else is going to be committed to your goals if you aren't.

● **Expect positive results.** Winners expect to win and losers expect to lose. Legendary football coach Vince Lombardi once said, "We never lose, but sometimes the clock runs out on us." You can expect positive results and still not get exactly what you want. But research demonstrates that those who think positively achieve overall better results than those that don't.

● **Take care of your people or customers.** If you take care of them, they will take care of you. The reverse is also true.

● **Put duty before self.** As a leader, you have a duty to accomplish the mission you have been assigned and take care of those who follow you. Sometimes the mission must come first, sometimes your followers come first. However, the interests of both must always come before your personal interests.

● **Get out in front.** Set the example and be where the action is. Don't sit in an air-conditioned office making decisions and call that leadership. Go out and talk to your people. See what's going on, and be seen.

It's not like this in your company or with your boss? Well, how do you like to follow a leader who disregards the eight universal laws? Are you happy working for such a leader? Do you want to do the best that you possibly can for him or her? Probably not.

Following these rules may not enable you to change your boss or other leaders in your company. But follow them anyway. Others will soon recognize you as a "born" leader.

If you keep at it, they may even say you are a great leader. You, however, will know the truth. You may or may not be a great leader, but you were most definitely made, not born.

Cohen, a retired major general with the U. S. Air Force Reserve, is a business professor at California State University, Los Angeles. He can be reached at wcohen@calstatela.edu. His new book, The Stuff of Heroes: The Eight Universal Laws of Leadership, is a Los Angeles Times bestseller.

MESSAGE

QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

Netmon clarification

Your article "OpenView snags routers" (Nov. 23, page 6) states that Hewlett-Packard's OpenView Network Node Manager contains an inherent problem with its Netmon network discovery features that can cripple routers. The following information will enable readers to better understand the function for which Netmon is intended and will place Netmon in the proper context.

Netmon is the discovery and polling engine for HP Network Node Manager. When Netmon discovers a device, such as a router, that has a non-LAN or



Beware the cult of IP

The IP craze has hit an all-time high. The slogan "everything over IP and IP over everything" captures the zeal with which many in the industry are pursuing the expansion of IP-based features and services. Everything that can possibly be crammed into IP — or on top of it — is.

The next step is to go completely minimalist — IP directly on fiber, or rather, over photons. Who needs Layer 2? Just slap Layer 3 directly on the media. That's the vision of some in the industry, including a Nortel Networks executive who waxed philosophical at the recent Internet Bandwidth (iBand) conference about unleashing gigabits of bandwidth in the public network. In his vision, high-speed routers would blast Ethernet frames over optical interfaces, directly onto SONET rings or the fiber itself.

I understand the rush to embrace IP. All projections show that data will be the vast majority of traffic crossing networks over the next five years. So if you're going to build a new integrated services network, you would optimize it for data.

What I don't understand is the fervor with which these IP-based efforts are being pursued. Many of the new features being added to IP, such as class of service (CoS) support and traffic management, already exist at other layers in the network. For reasons that are not strictly technical, these existing technologies are deemed inadequate and must be re-created in the image and likeness of IP.

And so it will happen. A swarm of engineers is working on the technologies for building a multiservice Internet. IP-based CoS and traffic management and IP-based telephony will become realities. The issue is when — and at what price to enterprise users.

As veterans of the Internet Engineering Task Force point out, the IETF is driven from the bottom up, not by a grand design. As a result, the standards-making body produces technology pieces, not integrated solutions. The building of end-to-end technologies falls to vendors, service providers and enterprise network operators.

Right now, key IP multiservice technologies exist only as evolving piece parts. Consider Differentiated Services (Diff-Serv), the newest IETF approach to CoS. Designed for use in the Internet, Diff-Serv is elegant in its simplicity. Each packet is marked with a special flag (a series of bits) that indicates how it should be treated. At each router hop along the packet's path, the router sorts packets into queues based on the flag. The queues themselves get different treatment, such as differing shares

of bandwidth, forwarding priority and probability of dropping a packet in case of congestion.

To date, the IETF has defined few actual classes of service based on Diff-Serv. Also, there is room for interpretation of what has been defined. Consequently, enterprise customers and ISPs will need to write service-level agreements (SLA) that clearly spell out which applications get which types of flags and how the ISP will actually act upon those flags.

Likewise, if the packet crosses the networks of multiple ISPs, these ISPs will have to define compatible SLAs and handle the packets in a comparable way for customers to receive the end-to-end service for which they've contracted. If two ISPs have incompatible SLAs or support different interpretations of the flags, the customer's end-to-end service will be "squishy," in the words of one of the Diff-Serv working group co-chairs.

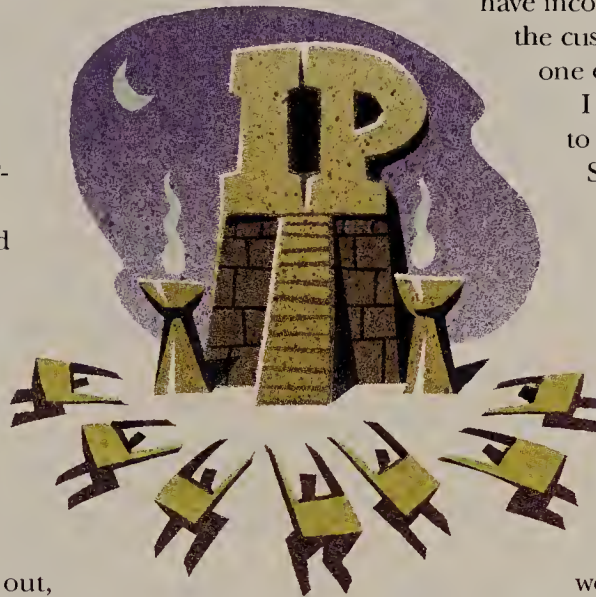
I don't know about you, but I don't think squishy CoS is going to cut it for voice. Or video. Fortunately, the sponsors of iBand, Stardust Forums, had the foresight to hold a meeting at the conference to discuss the need for a QoS forum. Representatives from nearly 50 companies attended the meeting. There was general agreement that such a forum is needed to clarify the business drivers behind QoS, bring the relevant technologies into focus and push interoperability testing.

Such a forum is needed if IP-based CoS is to become a reality on the Internet. If the industry must rely on bilateral SLAs to achieve end-to-end service, we'll never get out of the squishy phase.

Bear in mind that CoS is only one new area that the IETF is addressing. The organization now has roughly 200 working groups pursuing routing, addressing, security, policy and other technical areas. My concern is that, in this mad rush to embrace all things IP, we may fail to appreciate — and exploit — the capabilities of the installed base of technology we already have.

IP is one technology tool among others and can be used in a complementary fashion with other technologies. It's not a savior. Enterprise customers need to avoid getting carried away by this wave of hype and focus on the problems they need to solve today and the spectrum of tools available to them.

Petrosky is an independent technology analyst in San Mateo, Calif. She can be reached at mary@mpetrosky.com.



unnumbered interface, Netmon will request the routing table by default. Netmon uses the routing table to find new node information and identify WAN links. It is requested during initial discovery and daily configuration checks. The routing table can be very large, especially for border routers, which have direct Internet access. When Netmon requests the routing table, the demand for CPU cycles can affect the router. Netmon's request for the routing table information via SNMP has been an accepted industry practice for some time.

Network Node Manager's discovery can be configured to not request routing tables from newly discovered routers. Information on how to disable requests for routing table information can be found at <http://oweb2.external.hp.com/acp/notes/routing.htm>.

Jim Haselmaier
Marketing manager, Network Management Division
OpenView Business Unit

*Hewlett-Packard
Fort Collins, Colo.*

A tale of two Bills

When I read your article "Dr. Freud . . . meet Mr. Gates" (Nov. 30, page 1), I couldn't help but chuckle about the parallel between Bill Gates and another prominent American figure named Bill. I especially refer to the part in the section headed "Diagnosis two: Sociopath" that states: "He's able to manipulate the reigns of power without heavy emphasis and ethics. He controls with moral impunity. He shapes the truth to his own liking."

Who other than Gates immediately comes to mind when reading this? If you didn't come up with Bill Clinton within two seconds, then check your own pulse because you

haven't been alive for the past six years.

Greg Shank
Senior consultant
PSINet
Herndon, Va.

Regarding the article "Dr. Freud . . . meet Mr. Gates," I'm concerned that your publication is making a move to tabloid journalism. For every "top mental health professional" you find, I'm sure I could find 10 more with a different opinion. You're a technical magazine, so stick to technical news reporting.

Carl Fritzsche
Denver

Taking license with Linux

Your article "IBM adds Linux to file sharing" (Nov. 30, page 6) contains the statement

"IDC says that paid Linux license shipments increased 20% from 1996 to 1997 and that an even bigger increase is expected from 1997 to 1998."

Linux is not licensed in the traditional sense; it's packaged. The kernel and most of the

supporting utilities are free and can be freely redistributed.

There is no need to license Linux. As a result, there is no accurate way to gauge the size of the Linux community.

Tom Lovell
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SORT THROUGH THE ATM ADDRESS FORMAT OPTIONS
WITH US AND YOU'LL SLEEP BETTER TONIGHT.

ATM addressing: A network nightmare

By Jeffrey Fritz

It's the middle of night. The address format for your ATM network is due first thing in the morning. Your reputation as a network architect hangs on having designed an addressing scheme resilient enough for your enterprise.

It hasn't been easy. All the possible ATM address formats run through your head. Did you select the right one? You worry your address plan will limit your network. Did you leave enough room for future growth?

You wake up in a cold sweat. You've just had an ATM addressing nightmare.

ATM: A technology with a past

When it came to ATM addressing, the ATM Forum, the agency that was instrumental in promoting ATM, punted. While the agency looked the other way, four different ATM address types crept into the picture, each claiming to have its own purpose. But these purposes were never

widely publicized or understood, and users became confused about which type to use for what application. Misuse of all address types became widespread.

Here's the way it was supposed to work. The ATM User-Network Interface specification — which describes interface formats between ATM end-user devices and switches, or between private and public switches — defines ATM addresses as having three formats, each 20 bytes in length.

The first format, the Data Country Code (DCC), was intended for use on private ATM networks, particularly those that use ATM for data connections.

Another format, the International Code

Designator (ICD), is similar to DCC but was intended to be used in building internationally recognized codes, such as bar code systems and the Dewey Decimal System. It was not intended to be used as a format for addresses that would identify network switches.

The third format is an address specification dubbed E.164, which was intended for use on public networks. There are two permutations of this format. The version defined by the International Telecommunication Union (ITU) is known as E.164 Natural. The ATM Forum's version, also intended for public networks, is known as E.164 Network Service Access Point (NSAP).

Choosing from these address formats is simple if you don't need to connect your network to anyone else's; just use the format that makes the most sense for your needs. Likewise, addressing

INTENDED PURPOSES OF THE ATM ADDRESS FORMATS

Data Country Code (DCC): Private network addressing.

International Code Designator (ICD): Coding systems such as the Dewey Decimal System and bar codes.

E.164 Natural: Addressing for public carrier networks.

E.164 Network Service Access Point (NSAP): Originally intended for public carrier networks, it has evolved into an alternative for private network addressing.

is not a problem when interconnected ATM networks use only permanent virtual circuits (PVC). As with frame relay PVCs, the route from source to destination is always the same, making addressing less of an issue.

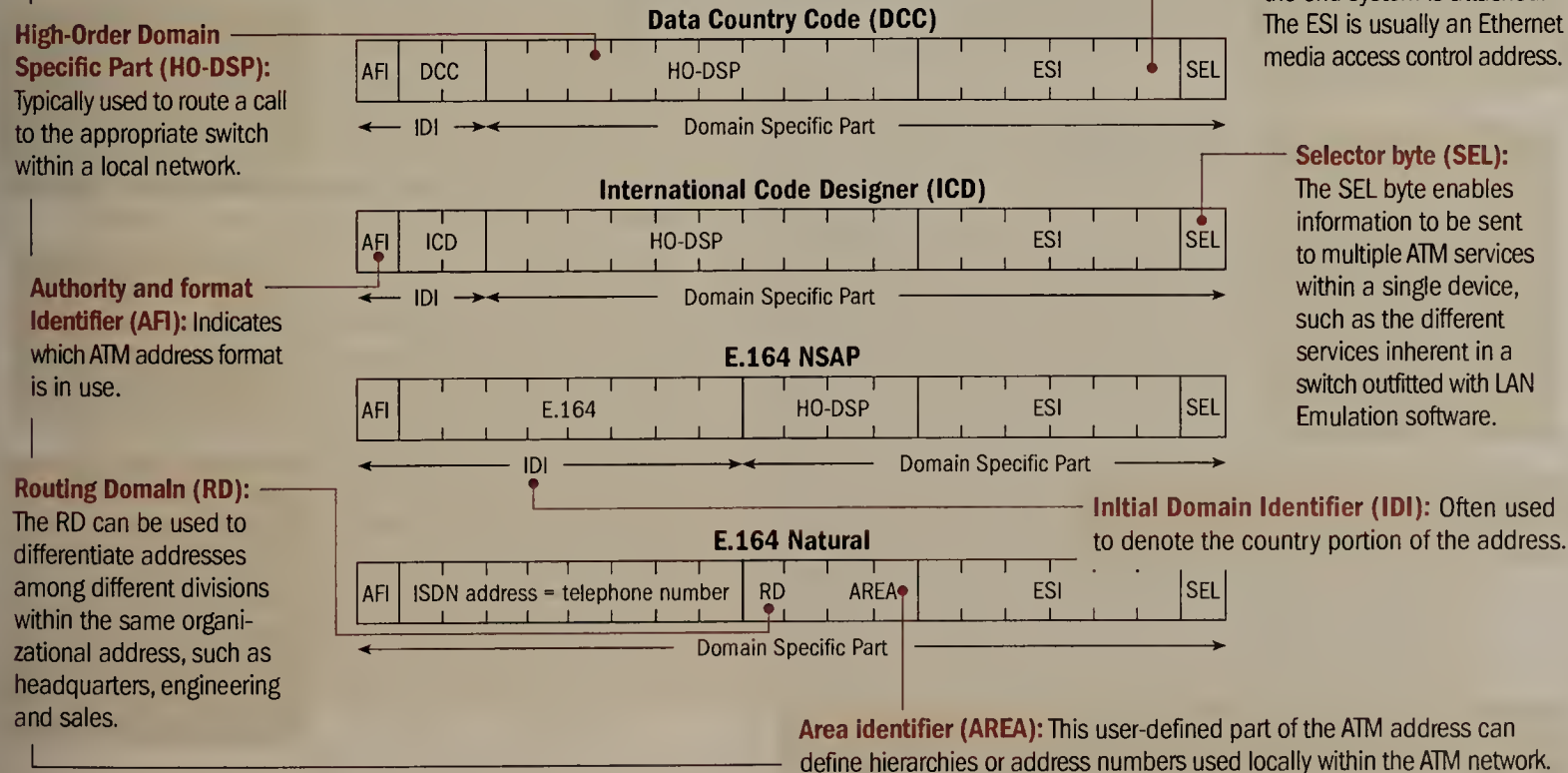
But networks, like people, tend to congregate. Sooner or later, you'll want to connect your network to that of a supplier, an affiliated company, or some regional or national network. If you use switched services to forge connections between

ATM networks, addressing quickly becomes an issue. You have to think about duplicate addresses and other issues to ensure calls are properly routed.

This will be a challenge, in part because there is no centralized body distributing ATM addresses. Instead, conglomerations of national and international agencies are charged with administering ATM addresses, each controlling specific formats. In the United States, ANSI is charged with handing out DCC ranges. The British Standards Institute is the gatekeeper of the ICD address range. The ITU's telecommunications unit handles the E.164 Natural format. As for E.164 NSAP, nobody seems to know who's in charge of it, although we do know the ATM Forum is not. Some carriers say they've used a format other than E.164 NSAP because of this issue.

ATM ADDRESSING DISPLAY

How the 20-byte ATM address space is allocated under each of the four formats.



Some users have eschewed the four formats altogether and have concocted their own ATM addresses. There is also rampant misuse of the four sanctioned address formats.

For example, when it comes to ICD addresses, the forum's addressing guide admits there was "a period in which ICD codes were assigned without strict adherence to the original purpose," which was for bar coding systems and the like. Today, the British Standards Institute won't give ICD addresses to companies for use with private network addresses, the guide says.

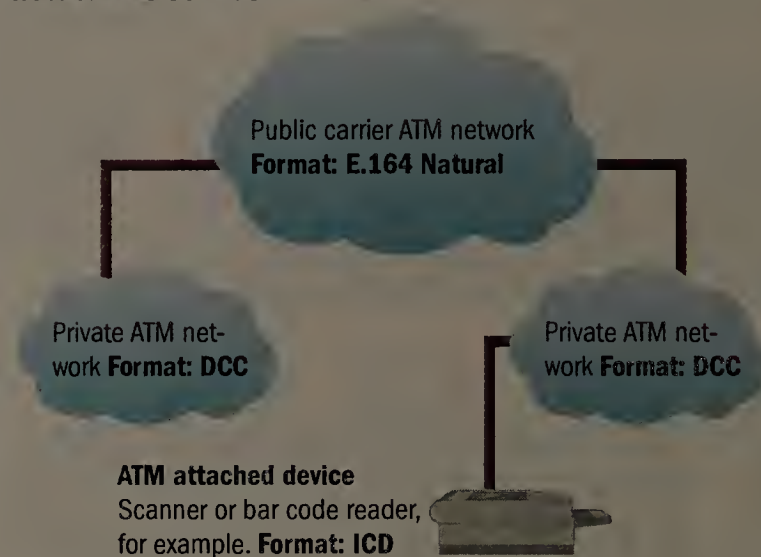
Meanwhile, at least two ATM vendors — Cisco and FORE — sell ATM products with preconfigured ICD addresses. In addition, public carriers, such as Bell Atlantic, have deployed ICD addresses as public net addresses and encourage their customers to use addresses from their ICD range in private networks. So much for intentions.

So which addressing scheme should you use? The answer is an unqualified, "It depends."

If you are dealing with a private network, DCC is the address format of choice for a number of reasons. First, it was intended for private nets. It has a decent-size addressing range and uses a device's media access control (MAC) address as the End System Identifier (ESI), which is the part of the ATM address that identifies a specific ATM device. This factor makes creating an ATM addressing scheme a bit easier because you've already got MAC addresses for each device. The DCC format is also administered by a U.S. agency, making things more convenient for domestic companies.

If you're addressing a public network, E.164 Natural is the recommended format. It has the advantage of using ISDN addressing, which is already used in the public telephone network. In addition, private networks using ICD or DCC addresses can usually translate their addresses to and from E.164 Natural.

HOW IT WAS SUPPOSED TO BE



It's this routing between public and private networks that gets especially tricky when it comes to ATM addressing. In theory, the Private Network-to-Network Interface routing information protocol could be used to route calls between networks, given that PNNI supports dynamic call routing within an ATM network. However, PNNI is promiscuous; it tends to provide a fair amount of information to the private network about the internal architecture of the public network. Carriers are loathe to part with that kind of information, so they use PNNI to route calls within their networks but rarely offer it to customers.

Carriers will, however, offer the use of their own ATM address ranges to customers. This comes especially naturally to voice carriers, which view the idea of offering ATM addresses as merely an extension of providing your telephone number.

This begs the question: If a carrier has gone to the trouble of registering an address range and is

offering it to customers, isn't that a good thing? The answer is "sometimes." Using carrier-provided addresses may be helpful for users with smaller networks who do not have the wherewithal to obtain and administer their own address ranges. Certainly, the ATM Forum encourages the use of provider-based addressing because it appears to be a reasonable way to achieve scalability in ATM routing and addressing.

The danger with carrier-supplied addresses is they can be restrictive. For example, some carriers refuse to forge a static route to their customers' networks unless the customers agree to use addresses from the

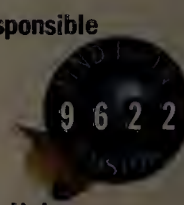
carrier's address range. This basically means your network is cut off from switched virtual circuit (SVC) service unless you accept the carrier's ATM addresses. Without the static route, other networks will have no way of finding your network, and vice versa. SVC service will be worthless.

Using carrier-supplied addresses can hamstring you in other ways. As an example, just look at what happened with Bell Atlantic's statewide ATM network in West Virginia.

Get more online:

Links to the various organizations responsible for ATM address formats:

- ANSI
- The ATM Forum
- The British Standards Institute
- International Telecommunication Union



Five old wives' tales about ATM addressing

1 ATM address formats are irrelevant.

ATM address formats could be considered immaterial if, and only if, your network is not, and never will be, connected to another ATM net.

2 My ATM network will never be connected to any other.

If you really believe this, you must be living in another generation. Networks want to interconnect. The network that is stand-alone now and will remain that way is rare indeed.

3 All ATM address formats are created equal.

This is analogous to Myth No. 2. Different ATM address formats were designed for different purposes (see graphic, page 41). True, the formats all consist of a series of octets — basically, groups of bytes — and many of the formats are similar in nature. However, the format distinctions matter now and will matter even more as ATM networks continue to spider web together.

4 Rolling your own addresses makes sense.

For networks that do not connect to other networks, addressing can be a matter of organizational preference. It is also true that rolling your own address format gives your network all 20 bytes

in the ATM address to use without restriction.

But when the time comes to interconnect your ATM net with another, you'll likely get a registered Network Service Access Point and have to change all the addresses in your network. So it probably makes sense to use registered addresses from the get-go.

5 It's OK to use the format that comes installed on your ATM switches.

You would be amazed at how common it is for network designers to deploy the addresses that happen to come out of the box with their ATM switches. Even major carriers have made this goof.

This Russian roulette scheme is fraught with danger. First, you are depending on the equipment vendor not to duplicate addresses on multiple switches.

Some vendors maybe careful about this, but don't count on it. In addition, you can forget about using a contiguous address range; the next switch in the sequence may have gone to another customer. Imagine the fun you will have should you happen to connect to that customer's network sometime in the future.

— Jeffrey Fritz

In offering provider-based addresses, Bell Atlantic allowed state government customers a skimpy 2 bytes of address space above the ESI field for their private networks; for enterprise networks, 3 or 4 bytes are usually preferred. The carrier also made it a requirement that the state accept addresses from the Bell Atlantic range if it wanted switched services on the ATM network.

The issue is important because the more bytes you have in an address space, the more levels of hierarchy you can create in your addressing scheme. That, in turn, has important performance considerations because levels of hierarchy allow you to create peer groups, which are groups of users that routinely communicate with one another.

West Virginia University (WVU), for example, doles out addresses to each of its schools and individual departments. Given that you have to allow for growth in each peer group, the addresses go fast. So when it originally established its ATM network, the school used 6 bytes of address space, leaving plenty of room for growth. (Six bytes of address space will give you room for more addresses than even the largest enterprise network will ever need.)

WVU was nonetheless pressed to drop its registered private addresses and make do with Bell

FEATURE

Atlantic's 2 bytes of address space, significantly reducing the number of available addresses and corresponding levels of hierarchy.

Two bytes of address space will give you upwards of 65,000 addresses. That may sound like plenty, but as you create peer groups, the addresses run out fast. Three bytes of address space, on the other hand, will give you more than 16 million addresses, providing much more breathing room.

Clearly, there are important issues to consider before you jump into any carrier's address range:

- Will the carrier offer you an address space of sufficient size to support growth? Network growth is inevitable, and you want to be able to obtain additional addresses.

- What happens if you decide to change carriers? Some carriers will take back their address range if you leave their net. Then you'd have to assign a new address to every ATM switch in your network — a major headache if your enterprise has a large number of ATM switches.

- Will the range your carrier gives you be contiguous? Routing to noncontiguous ranges can be nasty; it often requires multiple static routes.

- What is the carrier prepared to do in the event of an address conflict on its network or an adjoining network? With provider-based addressing, service providers should police ATM address assignments.

However, no one is really sure they will. Supposedly, the offending ATM service provider is held accountable if there are address conflicts. However, without centralized registration agencies how this will be mediated and resolved is anybody's guess.

Potential solutions

A better way to deal with carrier addressing issues would be through Network Address Translation (NAT), which is common in the IP world. IP networks frequently use one set of numbers internally while advertising another address to the outside world. Various types of NAT devices perform this function by maintaining a translation table that maps IP addresses in one range to those in another range.

NAT is exactly what is needed for addressing between ATM networks. Unfortunately, nobody has yet come up with a device that performs this translation in the ATM world.

The ATM Forum is working on "Bi-level Addressing," which would allow customers to use their own ATM addresses in private networks while using provider-based addresses between service providers. Bi-level Addressing devices would maintain a database having multiple entries, one for each carrier's network that connects with the private network. Unfortunately, the work on

Bi-level Addressing is moving rather slowly, so it is not likely to be available for several years.

Now that ATM networks are beginning to interconnect using switched services, the ATM Forum needs to take action on the addressing issue and take

prompt steps to fix these myriad issues. Bi-level Addressing is certainly a good start, but it does nothing to reduce the complexity of ATM addressing.

The way ATM addressing is being handled may well come back to haunt us. Unless it receives quick attention,

addressing could be the one aspect that significantly harms ATM deployment.

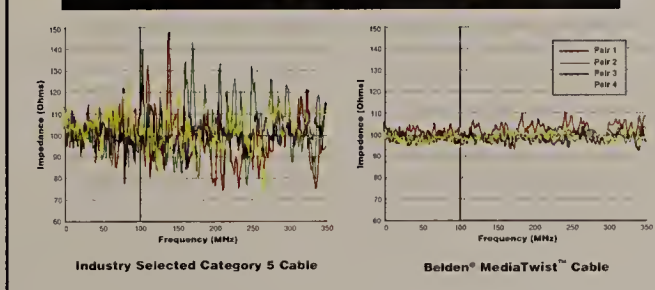
Fritz is principal network engineer for West Virginia University's network services group in Morgantown. He can be reached at jfritz@wvu.edu.

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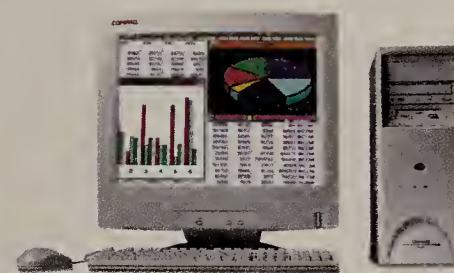
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Printers with pluses

Don't just buy a printer. For a few bucks more, get a resource everyone on the network can use.

Serendipitously, I received two handy

hardware boxes in the same week. Epson's Stylus Color 850N is a network color inkjet printer with great resolution. JetFax's M930 is a multifunction fax

machine that also acts as a printer and a scanner.

Both devices have a Centronics parallel connector for use with a desktop PC. The Epson printer also has a built-in network adapter that makes it accessible to anyone. A quick and easy soft-

ware install gives clients the proper printer drivers.

Print quality with the Stylus Color 850N is excellent. On special paper, you can print at 1,440 by 720 dots per inch — not magazine quality but without the graininess of 600-by-300 printers. The printer is a bit noisy, but I'll live with that for a high-quality printout of the fine color details in my graphics and images.

In contrast to the Epson printer, the JetFax M930 attaches directly to a PC. Without a built-in network adapter, other network users need to access the M930 through a PC acting as a fax server. It's wise to dedicate an old 486 to that task.

The hardware comes with an application called Jetsuite for Networks that lets

you print, scan and fax documents from your desktop. I was disappointed with the software. I used Jetsuite to save a scanned file in its Docs directory, but Jetsuite failed to recognize any documents stored therein.



Quick takes on high-tech toys

by Test Center Director

Lee Schlesinger

documents stored therein.

Though the online help claims Jetsuite includes a built-in optical character reader program for translating text in an image file to editable text, we installed the software twice without finding it. Fortunately, Caere Corp. sent me its superlative OmniPage Pro 9.0, which worked well with the M930's scanned in images.

When receiving faxes directly to the M930, I was vexed by paper jams.

I still haven't tested my ideal multifunction device — a color printer with a network interface that can also fax pages and scan documents. Anybody have any suggestions? ■

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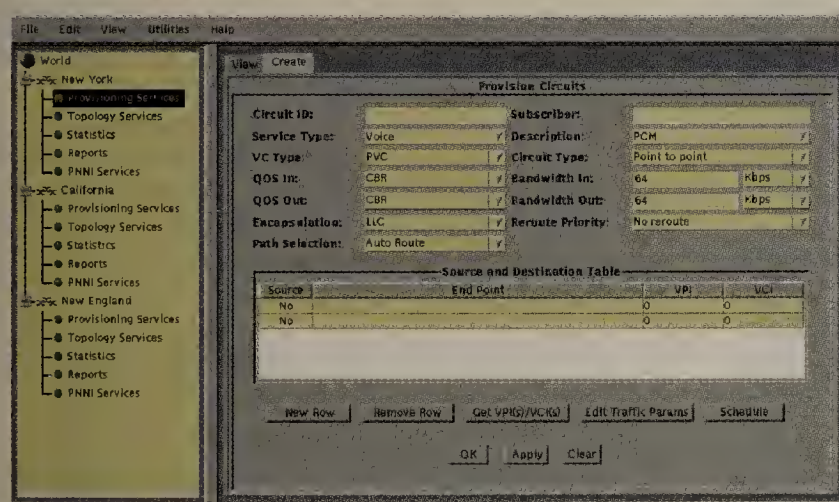
The wizard of ATM

By Jim Sobczak, Yu Liu, Sujata Banerjee and David Tipper

Think how often you've sat down with a piece of network hardware that costs more than you earn in a year and despaired that you'd never manage it properly.

Like the smiling paper clip that volunteers to walk you through writing a letter in Microsoft Word, Cabletron's new ATM management software offers to automate routine administrative tasks in a multivendor ATM environment. Spectrum ATM Services Manager 2.0 works in conjunction with your current proprietary management tools to help provision services, identify switch link failures and reroute traffic after failures.

FIGURE 1: PROVISIONING SERVICES



Templates make it easy to set up PVCs.

We found that Spectrum ATM Services Manager is easy to use and a good performer. With it, you won't have to coordinate separate on-site visits to configure edge devices and test circuits, and you'll save the time you now spend deactivating and rerouting circuits. The software is expensive, but the time it saves can offset some of its cost.

Spectrum ATM Services Manager makes the most sense in multivendor networks. Unfortunately, Cabletron's ability to support multiple vendors is limited to its own equipment, products from FORE Systems and Cisco's Lightstream line. Though that's better than

most of Cabletron's competitors — we couldn't identify even one competing product that offers any support for multiple vendors — the slim list is a problem.

Almost all of the large service providers have equipment from at least one vendor that doesn't support ATM Forum or IETF standards and can't be provisioned by Spectrum ATM Services Manager out of the box. Cabletron must customize an interface for such equipment.

If you have a single-vendor ATM network, the product doesn't add much that proprietary management software can't provide, except perhaps Cabletron's simple graphical configuration tool.

Path to provisioning

We were impressed with Spectrum ATM Services Manager's automated provisioning capabilities. Its graphical user interface (GUI) makes establishing permanent virtual circuits

Net Results

SPECTRUM ATM SERVICES MANAGER 2.0

Cabletron

(603) 332-9400

www.cabletron.com/atm/#em

\$7,500 for server plus a licensing fee based on the number of PVCs managed

PROS

- ▲ Simplified provisioning
- ▲ Automatic PVC rerouting when failure occurs

CONS

- ▼ Limited multivendor support
- ▼ Relatively high cost

(PVC) less of a chore. Defining parameters is simple, thanks to predefined templates (see Figure 1, this page). Alternatively, you can create custom templates that correspond to particular service offerings or unique applications. Spectrum ATM Services Manager uses a metrics-based path selection technique to satisfy the bandwidth and quality-of-service (QoS) requirements specified in the templates.

Cabletron provides QoS templates, which distinguish different types of traffic, such as voice and video, to assist administrators who are unsure of what QoS parameter values to specify. You can set up a complete PVC mesh among all the switches with a single command.

A major drawback, however, is that Spectrum ATM Services Manager can only monitor traffic on PVCs that it has set up. It can't monitor PVCs that were established independently with a switch's own vendor-specific provisioning tool. This poses a problem for large existing networks, in which it's not practical to reset established PVCs. Cabletron plans to address the problem in a future release.

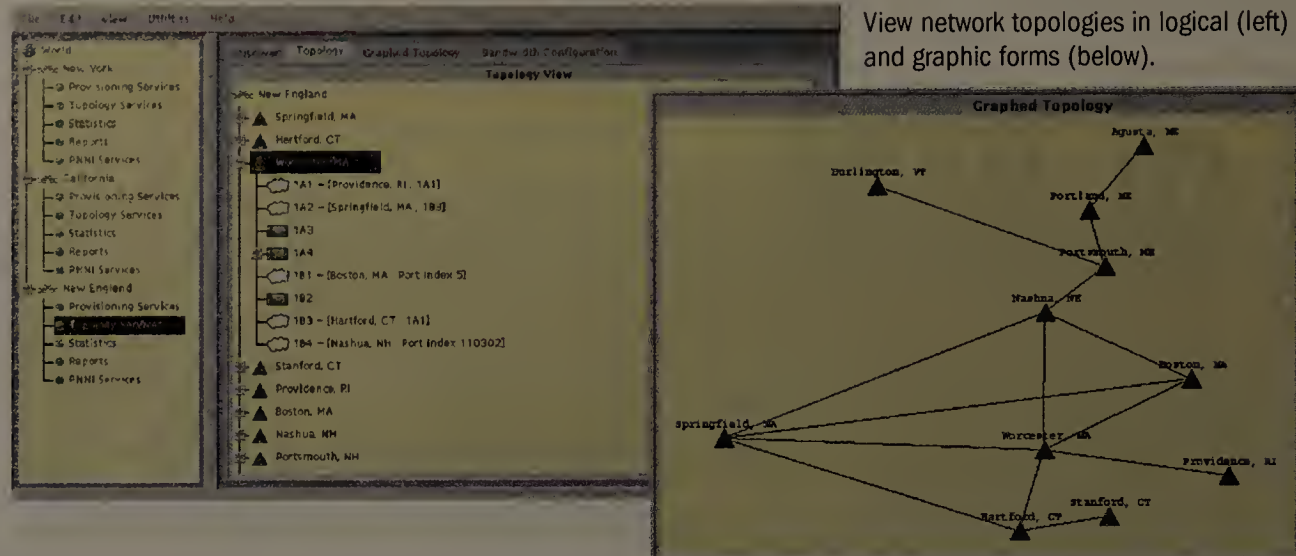
Additionally, Spectrum ATM Services Manager currently supports only PVCs and permanent virtual paths; Cabletron plans to add switched virtual circuit support in the first quarter of 1999.

Score Card

	Multivendor						
	Features (25%)	support (25%)	Performance (15%)	Ease of use (15%)	Installation (10%)	Documentation (10%)	Total score
Spectrum ATM Services Manager 2.0	7 x .25 = 1.75	5 x .25 = 1.25	8 x .15 = 1.20	8 x .15 = 1.20	10 x .10 = 1.00	8 x .10 = 0.80	7.20

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score.

FIGURE 2: NETWORK TOPOLOGY



Already incorporated in Spectrum ATM Services Manager is an automated discovery feature. We initiated autodiscovery from the product's GUI menu, which is well-designed and reasonably intuitive. Spectrum ATM Services Manager starts the autodiscovery process at the Management Information Base of the seed switch, identifies the neighbor IDs, and then follows each outgoing link until it discovers the entire network.

After discovery, we were able to look at the resultant network topology in logical and graphical forms (see Figure 2, this page), though currently the software can't graph hierarchical topologies. The topology graph shows the IP address of each switch, and a discovery screen lets you select a specific switch to see a list of properties, including active PVCs.

The topology is updated at the server by way of SNMP traps. If a switch link fails, for example, the traps capture this information. You can set an update timer parameter — we set ours to 25 minutes — that tells the client management console how often to obtain the updated topology.

Simple and intuitive screens also let you specify changes in a PVC for an established period of time. For example, you can modify a PVC that was originally configured as a telephony circuit and make it a video PVC for a two-hour period on a specific day.

However, Spectrum ATM Services Manager actually establishes a new PVC instead of creating a parent/child relationship, which strikes us as potentially confusing.

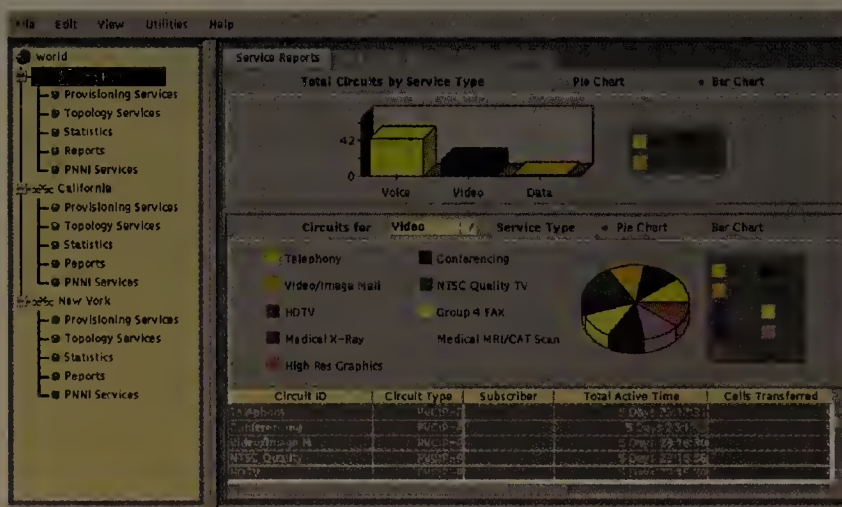
The ability to schedule PVC modifications gives you an opportunity to offer services that would be almost impossible to provide using manual collection methods. For example, you could schedule bandwidth and QoS parameters for a PVC to support telephony service during

working hours, video services at specific times during the week and high-bit-rate data services in the evening. Service reports help you keep track of the changes (see Figure 3, this page).

When a failure occurs, Spectrum ATM Services Manager can automatically reroute a PVC if the PVC was set up with the rerouting option. To test this feature, we disconnected a physical link after the network was established. In a few minutes, Spectrum ATM Services Manager established another route for that PVC. The system uses the same metrics-based approach as it does when PVCs are originally created to find the best alternate route.

With Spectrum ATM Services Manager, users can schedule the collection and export of billing information. The fields carried are fixed and can't be changed. However, the

FIGURE 3: SERVICE REPORTS



Keep track of PVC modifications by monitoring service type and activity.

data elements the software maintains appear to be comprehensive. The data elements include connection time; total cells transferred, dropped and lost to error; connection time period; bandwidth consumed; service type; alarms; and active call counts.

The 434-page user manual accompanying the product seems adequate. However, it performs double-duty — if you search for online help, you'll only find the same manual in a

Portable Definition Format file. It would have been more useful if the online help were context-sensitive and retrieved only information relevant to the screen being viewed.

At the end of the road

Quicker service configuration is one of the most compelling reasons to invest in Spectrum ATM Services Manager, thanks to its graphic configuration capability. Its automatic PVC rerouting capability has the potential to improve network reliability, depending on existing conditions.

Spectrum ATM Services Manager 2.0 costs \$7,500 with unlimited clients, although we expect that one to three clients would be adequate for most mid-size networks. In addition to the cost of the server, there's a licensing fee that, based on the number of PVCs managed by the Spectrum software, ranges from \$3,125 for 25 PVC licenses to \$225,000 for 3,000 licenses.

Get more online:

- Spectrum ATM Services Manager data sheet and white paper.
- Our ATM audio primer.
- News and specifications from the ATM Forum.



While the software is expensive, we think the gains for most mid-size to large service provider networks would offset the cost. We are skeptical, however, as to whether the product is cost-effective for even the largest private users who would have a harder time translating the product's benefits into quantifiable savings.

Sobczak is an adjunct professor, Liu a graduate research assistant, Banerjee an assistant professor, and Tipper an associate professor in the Telecommunications Program at the University of Pittsburgh. They can be reached at sobczak@tele.pitt.edu, yuliu@lis.pitt.edu, sujata@tele.pitt.edu and tipper@tele.pitt.edu.

How we did it

We installed Spectrum ATM Services Manager 2.0 on a network with a variety of ATM switches — three FORE switches (LE 155, ASX1000 with two network modules, and ASX200BX) and three Cabletron switches (SmartSwitch 9500, SmartSwitch 2500 and SmartSwitch 6000). We configured each of the switches with Private Network-to-Network Interface 1.0 or a later version.

We loaded Spectrum ATM Services Manager on a Sun Ultra-2 workstation running Solaris 2.5, which we in turn attached to an edge switch, Cabletron's SmartSwitch 2500. In our configuration, we loaded the server and the client on the Sun workstation; in a real network, remote clients can connect to the server using IP, but we wouldn't expect that to significantly affect performance.

Directory roundup

A guide to who's backing what horse in the directory-enabled network race, what they're planning and when they might cross the finish line.

By Neal Weinberg

If you're looking for a way to dynamically allocate security levels, applications and bandwidth based on who a user is or what he does, perhaps directory-enabled network tools are on your holiday wish list.

Sorry, but you'll be disappointed.

Despite a flurry of announcements from the four major internetwork players over the past two months, policy- or directory-based network software (they're essentially the same thing) won't be stuffed into anyone's stocking this year. Under the best-case scenario, the first products won't ship until mid-1999, and even then vendor implementations will vary considerably.

Part of the problem is a standards quagmire. The Desktop Management Task Force (DMTF) isn't expected to finalize its Directory Enabled Network (DEN) specification until late in the first quarter or early in the second quarter of 1999. DEN uses Lightweight Directory Access Protocol 3 (LDAP 3) as the protocol that links directories to internetwork gear, and key extensions to LDAP 3 — including replication — are still being finalized by the Internet Engineering Task Force.

The vendor lineup

Cisco, which coined the term "directory-enabled network" in 1997, has hitched its wagon to Microsoft's much-delayed Active Directory. Cisco engineers are working to integrate Active Directory with a new class of policy-based network tools the company is developing. The end result will be a product called Cisco Networking Services for Active Directory.

In an effort to quell user concerns that it is leaving Novell Directory Services (NDS) customers out in the cold, Cisco last month announced its existing CiscoAssure Policy Networking products — precursors to more advanced directory-enabled products slated to ship next year — will interoperate with NDS.

Specifically, Cisco says its Network Registrar already interoperates with NDS through LDAP protocols. The company also says its User Registration and Tracking product will be given NDS hooks by mid-1999 to enable you to allocate bandwidth by ports. Cisco Networking Services for Active Directory, on the other hand, will let you go a step further and dynam-

ically allocate bandwidth by user, no matter where that user logs on to the network.

Cisco's position is that industry standards will enable its future DEN products, such as a policy manager server and a firewall manager server, to interoperate with all directories, including NDS. However, the only full integra-

A SAMPLING OF DEN PLAYERS AND PLANS

Vendor: Cisco

Product: Networking Services for Active Directory

Ship Date: NDS version — none planned

Active Directory version — no date announced

Pricing: Not available

Works with: Cisco hardware only

Vendor: Lucent

Product: Cajun Rules Policy Server

Ship Date: NDS version — mid-1999

Active Directory version — no date announced

Pricing: Not available

Works with: Lucent hardware only

Vendor: Nortel Networks

Product: Optivity Policy Services

Ship Date: NDS version — mid-1999

Active Directory version — no date announced

Pricing: \$25,000 plus additional licensing fee per device

Works with: Bay/Nortel and Cisco hardware

tion of Cisco software and a directory will occur with Active Directory. Cisco has no plans to license, bundle or integrate NDS. That means if you want to use Cisco products with NDS, you'll have to write some code yourself or get an application developer to do it for you.

By contrast, Lucent and Nortel Networks have announced plans to license NDS and create products that merge the identification, authentication and administration features of the directory with their own policy-based software for managing routers and switches.

Nortel is working to integrate NDS with its Optivity Policy Services suite, while Lucent is using NDS as the data repository for its Cajun Rules Policy Server. Both products are scheduled to ship in mid-1999, and both companies plan similar products for Active Directory when Microsoft delivers.

3Com announced earlier this month that it will ship policy-based network products, including a policy server, early next year. However, 3Com is not licensing or planning to integrate any directory with its products. Rather, it is making its products compliant with all of the requisite industry standards so customers can use its software with anyone's directory.

Waiting not so patiently

Despite the dearth of products, users see the promise of directory-enabled networking.

Scott Richert, manager of network services at Unity Health, a consortium of six hospitals in the St. Louis area, says DEN tools could help him give doctors priority over clerical employees when they're vying for the same low-bandwidth links to clinical applications.

DEN products would also help Richert implement security policies and access lists from a central directory. Today, for example, he ensures only doctors have access to the medical records database by building access

lists in every router a physician might use — a real problem given that physicians bounce around all day from office to clinic to hospital.

But the varying vendor strategies are also causing some confusion among users, especially those who are committed to both NDS and Cisco.

Tim Talbot, director of technology deployment for PHH Vehicle Management Services in Hunt Valley, Md., is one such user. Talbot says he'd like to use directory-enabled network products to establish a priority scheme for traffic coming into the Internet-based call center he's developing and for some Internet applications PHH offers to clients.

Talbot says Gartner Group analysts have been telling him to hold off on implementing Active Directory until at least 2001. As for NDS, "it's here now and we're using it," he says. Net result: He plans to wait a year or two to see how things shake out.

Larry Bradley, senior network engineer at Georgetown University's business school, which has also standardized on Novell and Cisco, is taking a more hard-line approach. He wants to be able to grant access to the school network based on user identity, not physical devices, such as PCs or ports, as is the current practice. Bradley says he hopes to be able to accomplish this with a simple IOS upgrade that will provide hooks to NDS.

But he warns that if Cisco doesn't integrate with NDS or only gives "lukewarm support," he would consider switching hardware vendors the next time he needs to upgrade. ■

Management Strategies

Swinging the deal

Companies are pulling out all the stops to woo graduating seniors.

By Kim Girard

It's a rainy fall evening, and some 500 people of all ages are gathered to hear the sounds of The Delegates. A few people dressed in outfits reminiscent of the 1940s swing era are jumping, jiving and wailing on the dance floor, though most of the crowd is wearing 1990s garb and standing on the sidelines.

But this isn't some nightclub that's taken up the recent swing craze to attract a crowd. Rather, it's The Computer Museum in Boston, and the attendees at this "Swing into your future" event are recruiters from high-tech firms and their prey.

Employers know that sending a recruiter to a local university to lure the best and brightest is no longer enough. Dances, dinners, ski trips, online events and free stuff galore have become part of the hard sell in an IT recruiting war.

In some recruiting circles, limousine rides from the airport and a little over-the-top wining and dining are standard fare.

Trilogy Software spent \$15,000 this year on a dinner and mixer at a swanky five-star restaurant to woo seniors from the University of Pennsylvania. The Austin, Texas, firm shipped boxed barbecue dinners to its promising candidates and invited others on a weekend ski trip to Deer Valley, Utah. New recruits from the Class of 1998 topped off their first few months of training with a weekend trip to Las Vegas.

Jeff Daniel, director of college recruiting at Trilogy, says the recruiting game comes down to knowing what your candidates want.

Where does Trilogy draw the line? "I think it becomes common sense," says Daniel. "There's a really fine line between what's right and what's low-board. I have no problem drawing distinctions between companies, but we don't put down a company."

Trolling for talent

Why all the special treatment? There just aren't enough graduating students with IT skills to go around. Last year, the U.S. Department of Commerce reported a 43% decline in computer science graduates from 1986 to 1994, the latest year for which figures were available. There are 190,000 unfilled IT positions at large and mid-size companies, and the labor shortage is expected to get worse.

So it's not surprising that about 20 companies shelled out \$2,000 apiece for a table at the Massachusetts Telecom Council's recent swing dance recruiting event. The investment was well worth the price to Eric Giler, president of Brooktrout Technology, an electronic messaging firm in Southboro, Mass. If Brooktrout fills just one of



Recruiters at the Massachusetts Telecom Council's swing dance event are hoping students flip for their IT jobs.

its 50 job openings, the company can avoid paying a headhunter the typical bounty of 20% of a new hire's annual salary.

Giler says he came to the event to find an informal environment that would lure the students out for the night. Upstairs, the band was blasting a tune as dance instructors taught their partners to swing, while downstairs, students grabbed free soda and sandwiches.

Elsewhere in the country, the recruiting is just as hot. But Patrick Coulson, manager of university relations at Cisco in San Jose, draws the line at tactics he thinks are just too slick. That might mean refraining from jumping naked into a hot tub with 50 students, as he once saw a fellow recruiter do.

"Everybody is doing more now," says Coulson, who works with a staff of 13 recruiters — the majority of them in their 20s — who must fill about 300 jobs this year.

For Coulson, the trick to recruiting is making the top students think his company has the coolest people. That means attending a frat party or heading to a pub after hosting informal "infos-

sions" focused on Cisco's laid-back culture.

At a recent University of California-Berkeley/Stanford University football game, recruiters placed fanny pads with the Cisco logo on stadium seats. When the camera panned for a field goal kick, recruiters stood holding a huge poster emblazoned with Cisco's URL.

Overall, recruiters nationwide are seeking a more relaxed interviewing atmosphere where they can forge more personal relationships with coveted computer science majors.

Within industry circles, Cisco, Hewlett-Packard, IBM, Intel and Microsoft are known as more aggressive recruiters, while Sun and Oracle tend to let students do more of the pursuing.

Tim Heaslip, a staffing consultant at Lucent in Concord, Mass., says The Computer Museum's fall swing dance was one of the best recruiting fairs he's participated in. "It lets students let down their guard," he says. In turn, the fair gave him an opportunity to sell Lucent's message of being a place for a lifetime career.

Heaslip estimates he talked to about 100 students from Boston University, Northeastern University, Tufts University, the University of Massachusetts and Wentworth College, along with a few ambitious high school seniors. He left the event with a stack of resumés.

Anne McKenna, senior manager of university relations at Nortel Networks in Billerica, Mass., was also on hand at the job fair as part of a stepped-up recruiting campaign. One of Nortel's recruitment initiatives was to pay conference admittance fees for 90 college seniors to attend NetWorld+Interop 98 in Atlanta last fall.

Michael McNeal, director of employment at Cisco, has a few innovative recruitment tricks of his own. McNeal hires employees who do nothing but scour Internet newsgroups to find people who are doing interesting work. He also runs employment ads on the silver screens of multiplexes in Silicon Valley before movies that seem likely to attract a high-tech audience.

As competition for IT workers gets even more fierce, recruiters are willing to try anything. If the swing dance revival can help, bring on the Lindy Hop, they say.

Girard is a freelance writer in Somerville, Mass. She can be reached at Kimberg30@aol.com. Neal Weinberg, Network World's features reporter, contributed to this story.

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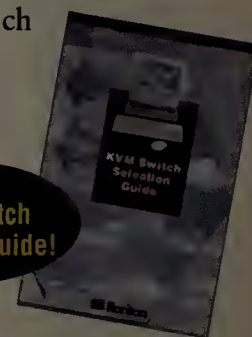
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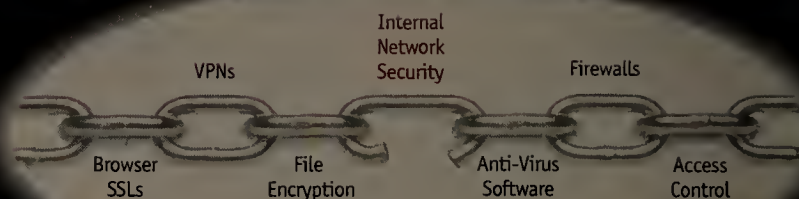
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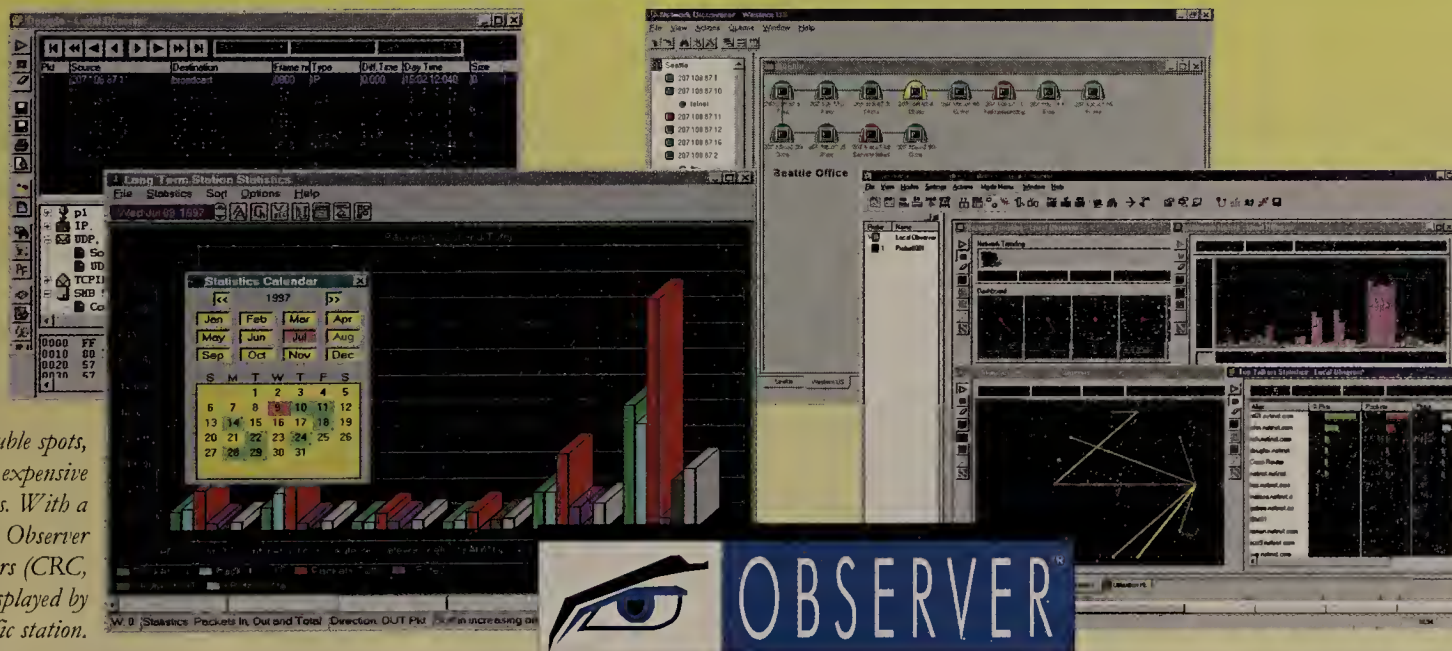
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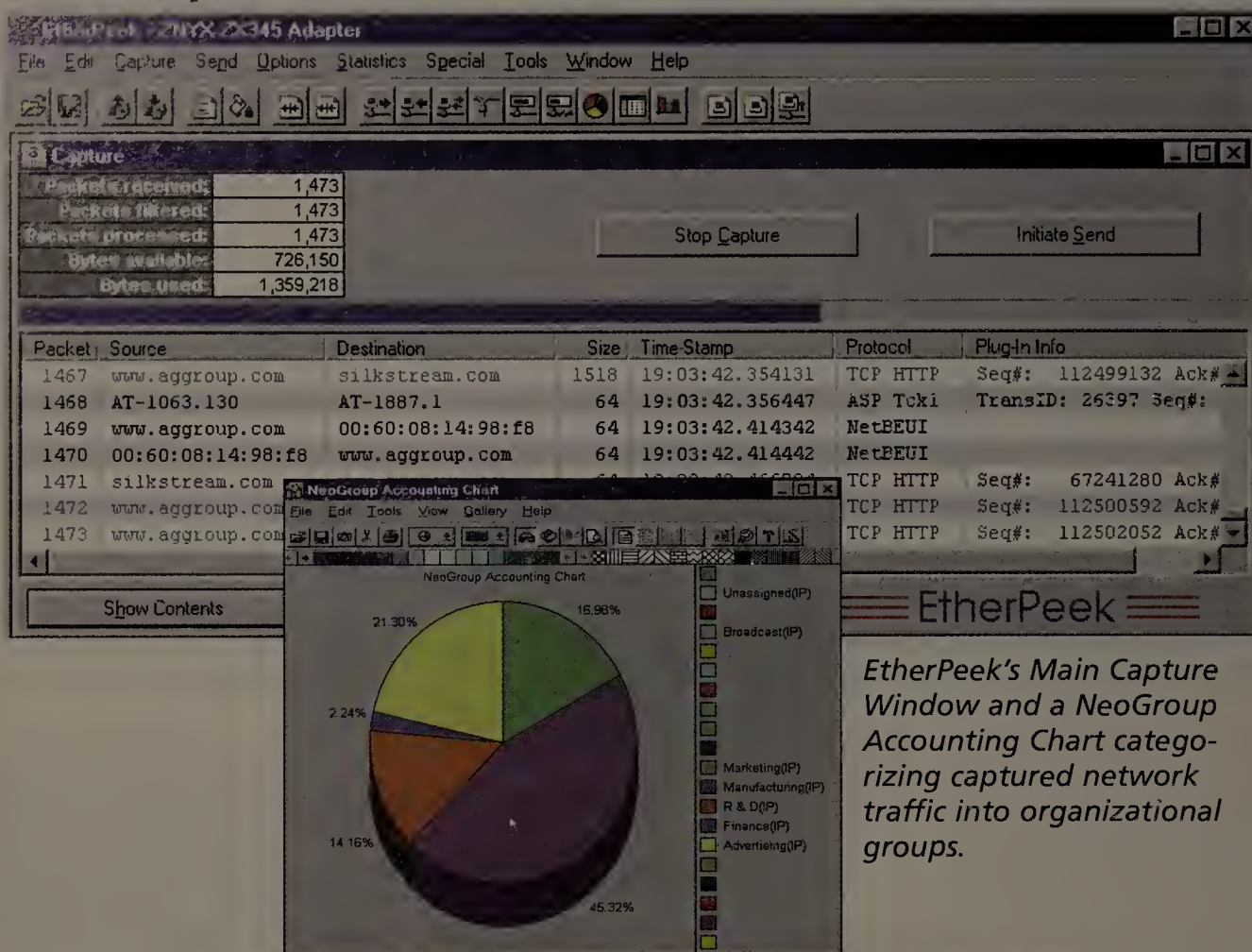
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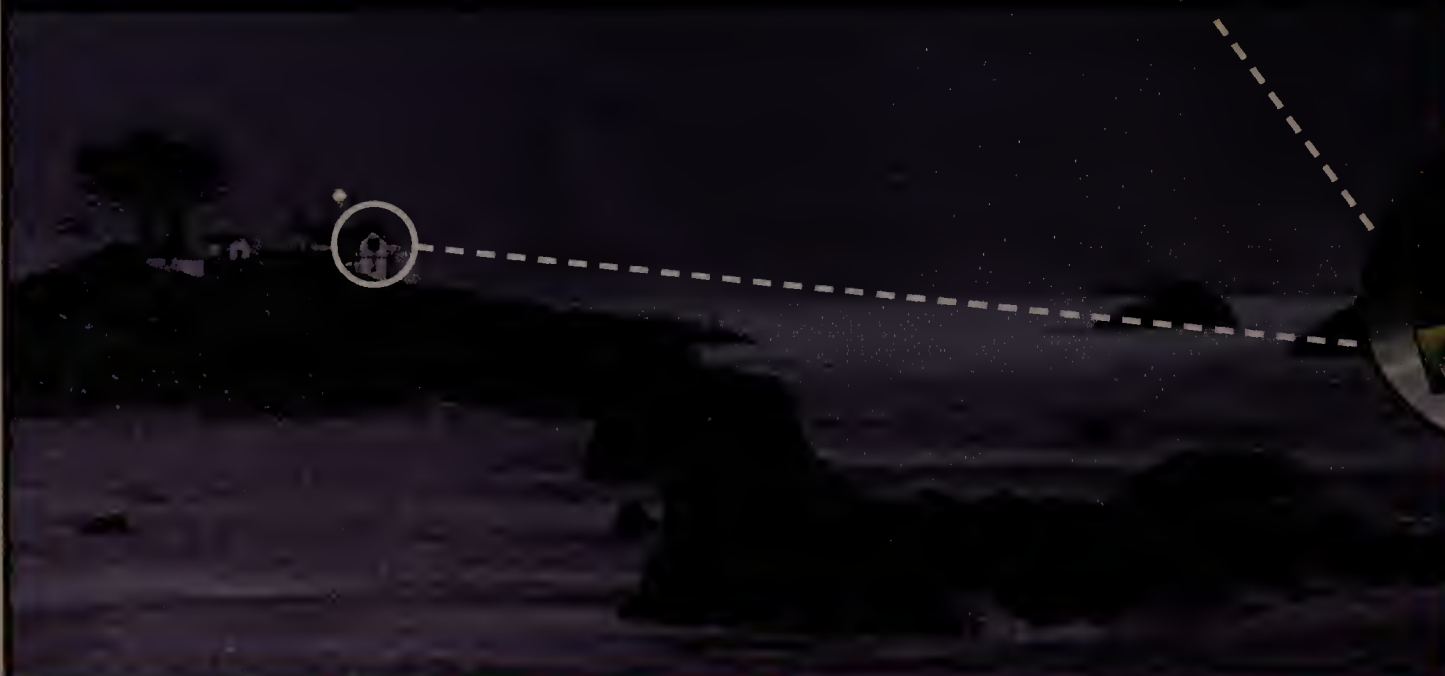
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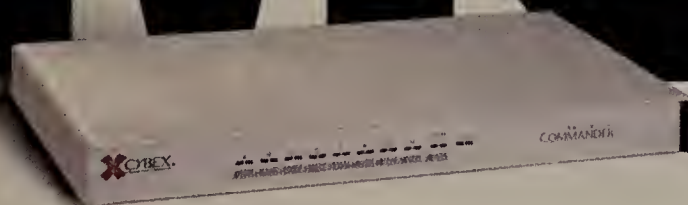


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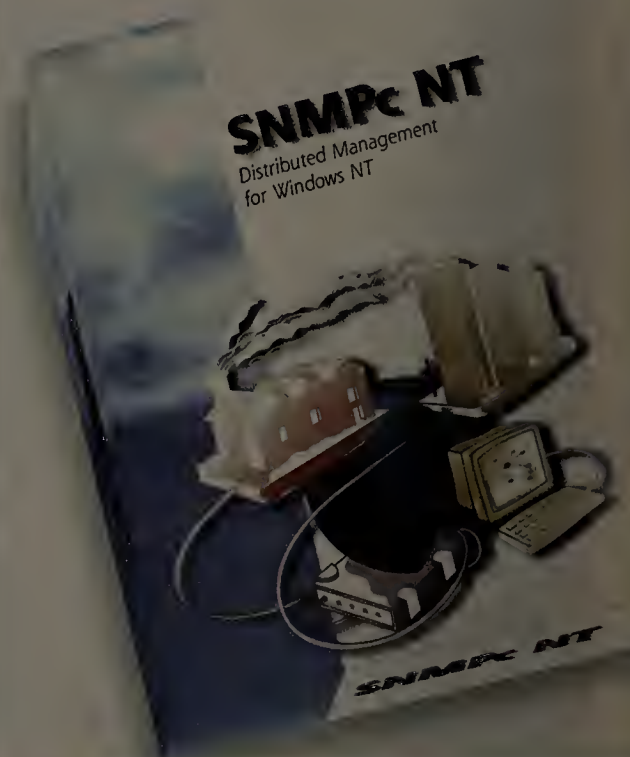
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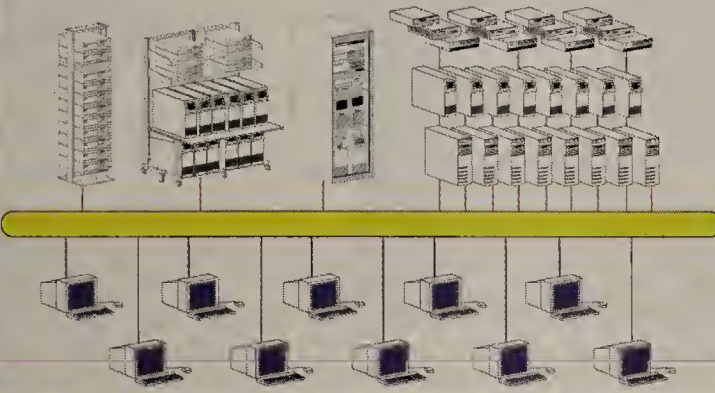
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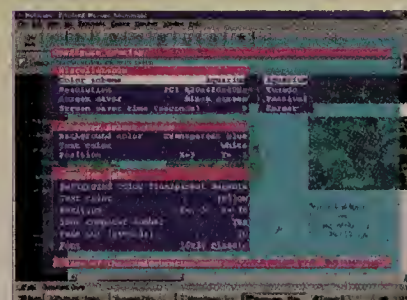
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


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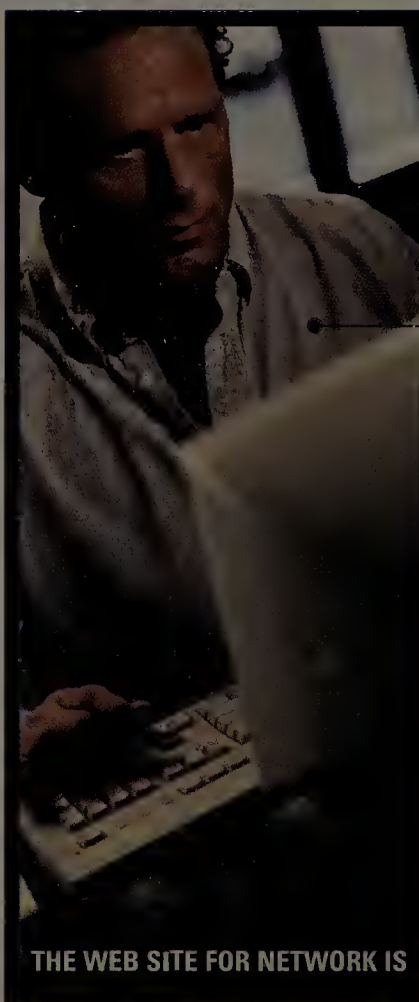
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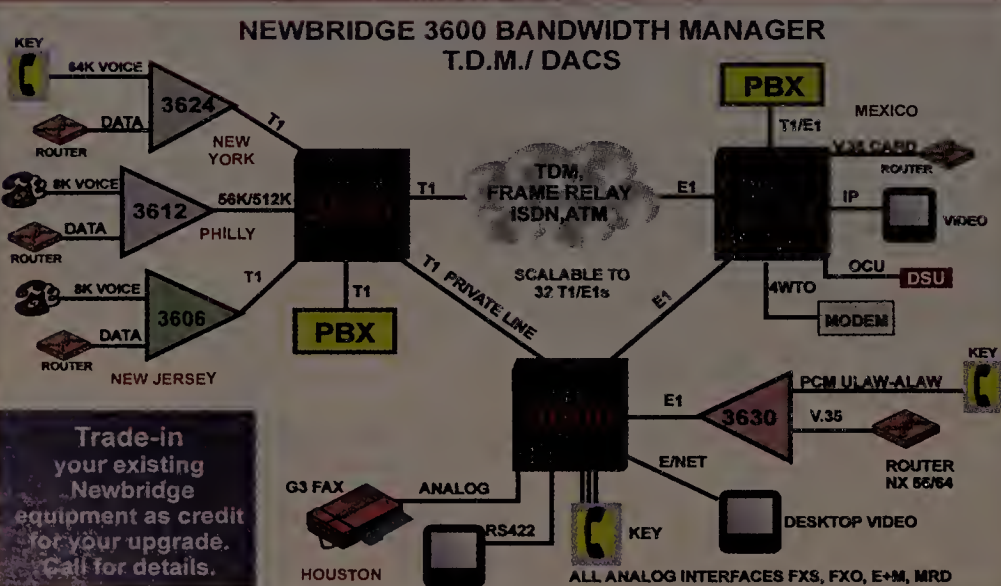
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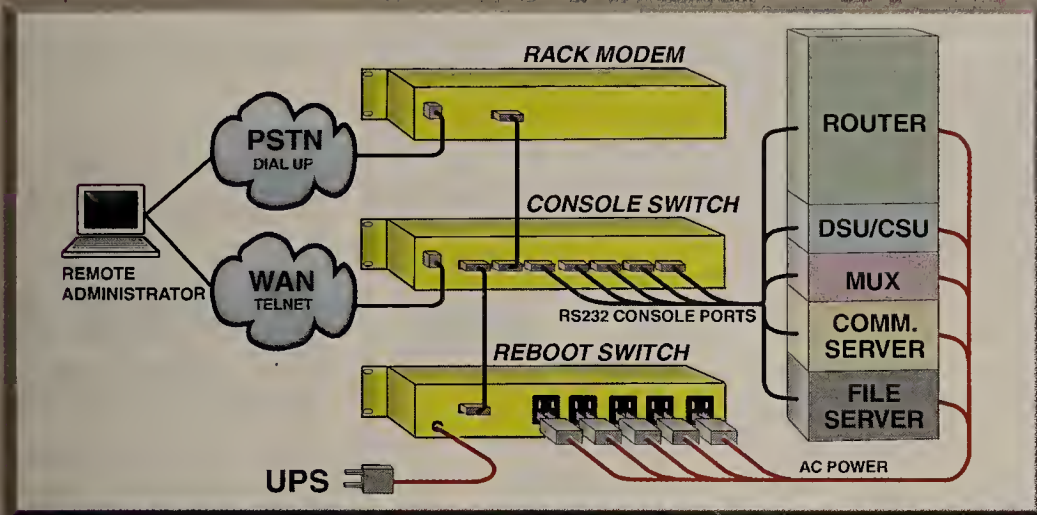
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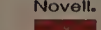
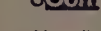
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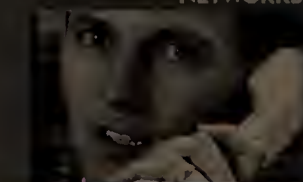
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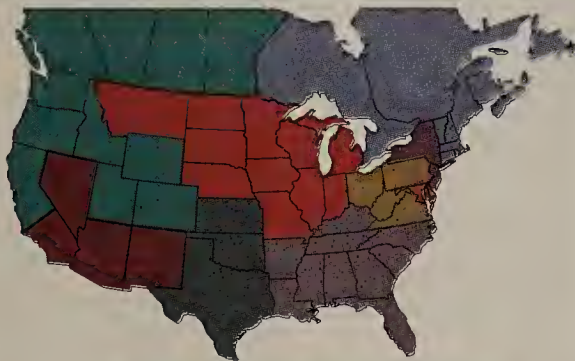
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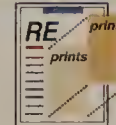
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MCI

Continued from page 1

ic ATM switches, sources say the move will mean that numerous Newbridge Networks ATM edge switches on the MCI side will be decommissioned some time in 1999. Cisco switches on the WorldCom side will begin taking over the lion's share of the company's ATM traffic.

Making the decision to move the ATM service largely hinged on the old MCI's shifting merger plans. After British Telecommunications announced its intent to buy MCI in late 1996, MCI installed Newbridge switches to match ATM gear in BT's network, says Frank Dzubeck, president of Communications Network Architects, a consulting firm here. But after WorldCom outbid BT for MCI in fall 1997, the switching strategy shifted to WorldCom's preferences.

MCI WorldCom senior vice presidents Vinton Cerf and Jack Walters told *Network World* that WorldCom's Cisco-based ATM platform is more extensively installed internationally. And Brian Brewer, MCI WorldCom's senior vice president for business-services marketing, added

that MCI WorldCom is emphasizing global seamlessness on all services. "There is no exception on ATM," Brewer says.

Going with WorldCom's Cisco switches makes sense from the standpoint of integrating IP applications and offering ATM WAN services for users, says Rick

supports MPLS. The result: MCI WorldCom will be able to better support frame relay-to-ATM interworking, Malone says.

Still, MCI customers will have to make a choice of whether to switch to the WorldCom platform. Carrier officials say the MCI hardware will be supported

companies, such as Newbridge and FORE Systems, as well as to carriers and service-support organizations.

One such former employee complains that WorldCom's ATM backbone "lacks sufficient capacity" to handle the combined companies' traffic. He

network.

Analysts say they doubt the merged company would dare let needed capacity slip, but they add that more personnel defections are likely. Published reports last week said EDS Corp. is looking to take over much of MCI WorldCom's data-processing and billing operations, perhaps as part of a deal to absorb MCI WorldCom's Systemhouse outsourcing subsidiary.

CEO Bernard Ebbers is said to favor such a deal. "This goes back many years with Bernie," Dzubeck says. "WorldCom outsources all their back-office functions to EDS."

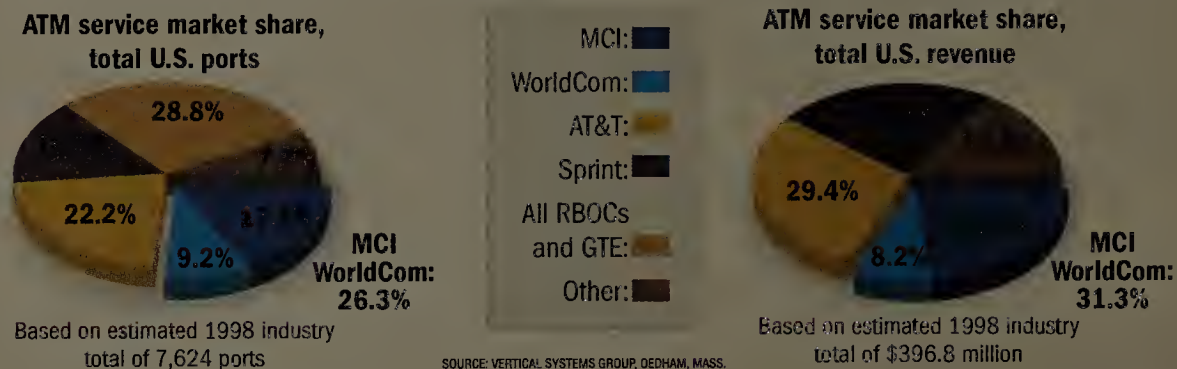
And Ebbers is said to be balking at keeping all of MCI's old systems staff aboard. "MCI has thousands of people doing programming," Dzubeck says.

A deal with EDS would likely absorb some, but not all, of MCI's current systems staff, Dzubeck adds. An MCI WorldCom spokesman declined comment on a possible EDS deal.

On the voice side, sources say the reason the merged company is leaning toward MCI's international voice gateways rather than WorldCom's is because MCI has newer switches and more direct connections to overseas service providers. ■

THE HAND THAT FEEDS THEM

Original MCI users are still providing the bulk of MCI WorldCom's overall ATM market share, which exceeds AT&T's only by virtue of the MCI/WorldCom merger:



Malone, president of consultancy Vertical Systems Group. That's because Cisco supports Multi-protocol Label Switching (MPLS), a technique for inserting IP traffic-management information into ATM and frame relay headers. Ascend, which is expected to provide MCI's future frame relay switches, also

for a while but not indefinitely. Migration decisions will be made on a customer-by-customer basis.

And the company's move to take the MCI ATM network out of commission comes with another consequence: the apparent flight of former MCI ATM specialists to equipment

says he left because the decision shows "the company's sacrificing quality for the sake of cost, and I didn't want my name associated with it."

Brewer dismisses the complaint. "Don't assume that any network is going to be static," he says. "We expect to continue to dramatically grow" the ATM

Sprint

Continued from page 1

the start. (NW, June 8, page 1).

"I don't know of a soul who

actually believes stuff coming out of Sprint," says Frank Dzubeck, president of Communications Network Architects, a consulting firm in Washington, D.C. "The company just

creating it as it went along."

Meanwhile, the roster of key vendors associated with ION has been shifting. The original announcement included a partnership with Cisco for the on-premises Integrated Services Hub — a piece of customer premises equipment that would aggregate voice and data traffic over a single access facility.

Instead, the tiny band of test customers are using Nortel Networks ATM switches to perform that function, though the users intend to employ Cisco gear down the road.

For example, Hallmark Cards in Kansas City, Mo., which in November was the first ION beta customer to get the service underway, has installed Nortel Passport ATM switches to reach the ION service nodes.

But Jim Miller, Hallmark vice president of IS, concedes that ION is missing a key benefit. The network is supposed to provide "dynamic allocation" of access channels, meaning that users can save money by switching some access links back and forth from voice and data traffic as time of day and other factors require. So far, Hallmark is run-

ning data traffic over some fixed facilities and voice over others.

Reliance on telco access facilities also has played a part in start-up delays. "It took us more than two months to configure the switches and to get the agreements with the local telephone companies to do what they needed to do," Miller says.

The other company to have tested ION is Yellow Freight. Sprint officials say the transportation company began running traffic shortly after Hallmark started its test.

Another scheduled beta user, Ernst & Young, is "still in the planning phases of the pilot," according to Russ Davis, assistant director of network services.

And the other scheduled testers have backed off a bit, citing a grab bag of reasons.

"We planned on having the trial up and running in the November/December time frame, but we are moving offices and have pushed off the beta trial for a short time," says Larry Harden, a manager of information services at Sysco Foods, a Houston food distributor.

Tandy has decided to delay its

ION test until a switched-access option is available sometime during 1999 because the company is primarily interested in ION access at its Radio Shack retail locations, according to Mike McRoberts, director of next-generation networks product management at Sprint.

Ironically, Radio Shack is an ION partner and hopes to sell small-business and residential ION premises hubs in the future. The last announced ION beta tester, Silicon Graphics, also has not begun using the service, according to McRoberts.

But the commercial availability announcement last month is valid because Sprint has tested ION extensively in its labs and at 15 locations, McRoberts says. Thousands of Sprint employees are using ION services now. But McRoberts concedes that the beta tests will have to be completed before Sprint can set service-level agreements for ION.

Senior Editor Denise Pappalardo contributed to this story.

Big DSL bet pays sleek reward

Venture capitalist and former Copper Mountain Networks executive David Helfrich last week walked into the digital subscriber line (DSL) equipment maker's board meeting and handed Sales Vice President Mike Kelly a gift box.

Inside the box was a model of a 1999 silver Porsche Boxster. Outside the building was the real deal — Kelly's winnings from a recent bet with Helfrich, who said Copper Mountain would never win the big contract it just signed with UUNET WorldCom. Kelly and the rest of the meeting participants stepped outside to ogle the spanking new car and then Helfrich took Kelly for a spin around the block in the \$60,000 vehicle.

"David has set a fine example for the entire investment community," joked a still shaken Kelly, who says he hasn't bought a new car in 20 years. He said the bet was widely known about throughout Silicon Valley "and I was wondering if David was ever really going to pay up."

— Bob Brown



Porsche Boxster

Impeachment hits Exchange before president

By Sandra Gittlen and Jason Meserve
Washington, D.C.

A load of incoming impeachment-related e-mail last week threw the U.S. House of Representatives' messaging servers for a loop — literally.

The heavy traffic touched off a bug in the government's Microsoft Exchange 4.0 software, leaving congressmen interested in gauging the mood of online constituents staring at blank screens.

"We haven't received any e-mail since Monday," said Carey Dearnley, press secretary for Rep. George Gekas (R-Pa.) on Wednesday.

House members and their staffs send and receive e-mail through a central system of 14 servers running Exchange 4.0 and Windows NT 4.0. The system, which serves more than 10,000 users, slowed down when two of the servers malfunctioned, according to Jason Poblete, a spokesman for the House Oversight Committee. "The bug kept e-mail messages in a continuous loop without delivering them," he says.

Microsoft says the 3-year-old version of Exchange couldn't handle the increased volume of e-mail because its processing limit is 16G bytes of data. Normally, the House only receives 80,000 e-mail messages per day, but more than a million flooded in last week, Poblete says.

"The possibility of message looping in Exchange 4.0 in particular network configurations has been known for some time," says Doug Stumberger, product manager for Exchange. However, Microsoft says the problem has been corrected in post-

Release 4.0 versions.

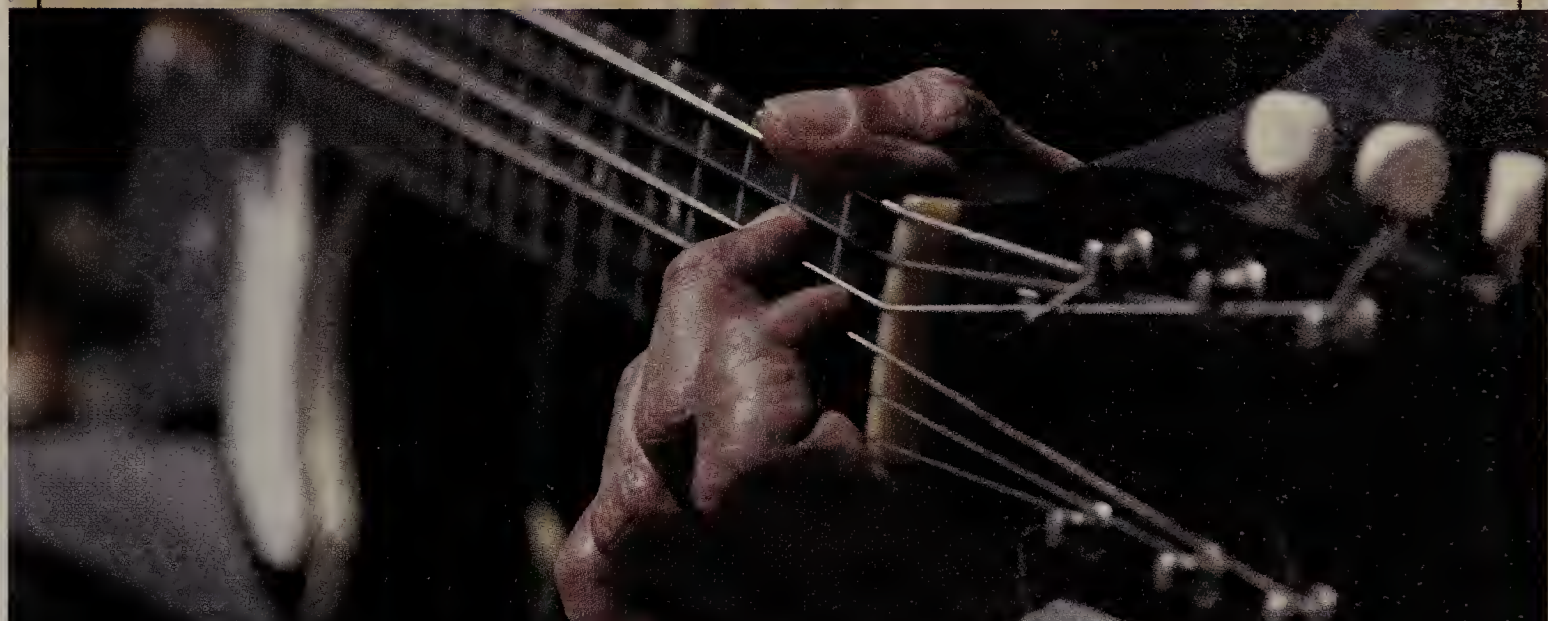
Exchange 5.5, which the House intends to upgrade to next month, has no limit on the messages that can be

managed, Stumberger says.

"It is all but impossible for this situation to occur with Exchange 5.5," he says. Although Microsoft and the House

say the bug was patched within a few hours, some representatives were still waiting for backlogged e-mail as late as Thursday. ■

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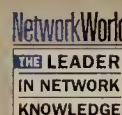
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Whoa, whoa, whoa: Don't perturb Santa



Santa Gibbs here bringing joy, merriment and glad tidings to good little networkers everywhere. All the rest should watch out for Santa's boot.

Yes, indeed, this is the time of the year when we (or at least some of you) find the time to kick back. But I have work to do, like pulling together my "Naughty or Nice" list and figuring out who gets candy or coal.

Let's see . . . Scott McNealy, hmmm. I just got a press release, "Internet Visionaries Ellison and McNealy to Announce Industry-Shaping Software Deal." Internet visionaries? Reindeer apples. Since when does jumping on a long-past bandwagon to hawk your products qualify you as a visionary? Please. It is going to be coal for Scotty. A bag full, and the same for Larry.

OK, who's next on the list? Why, it is young Scott Bradner. Let's see what he has been up to. Well, I never . . .

Seems he took a potshot at me last week (NW, Dec. 14, page 40). Master Bradner objected to my ruminations on ICANN, the Internet Corporation for Assigned Names and Numbers, which replaces the dreadful Network Solutions, Inc. in the management of the Domain Name System.

He starts, "Mark Gibbs knows what he is talking about most of the time, but that's not the case in his column on the ICANN (NW, Nov. 30, page 68)." Oh, Scott, as they say out West, "Them's fightin' words." The trouble is, I'm not quite sure what he wants to argue about. His column didn't actually make a point other than to say he thinks ICANN is a good thing and I don't.

Essentially, Scott relied on the mid-November ICANN meeting as validation of the whole concept of ICANN. His argument appeared to be that the majority of attendees were happy, and because an academic outfit called Educarse got up and said what

amounted to, "Go team, go," ICANN is OK. Once again, I must resort to the use of the inane but vaguely amusing expletive of "reindeer apples."

So the majority at the meeting was happy, big deal. If I were running ICANN, I'd make sure that the audience had as big a contingent from my booster squad as possible. But despite those shiny, happy people, remember Abraham Lincoln's maxim, "You can fool all the people some of the time, and some of the people all the time, but you cannot fool all the people all the time."

Scott, the rah-rahing of an unrepresentative majority at a meeting is not a validation of ICANN and ignores the very real concerns that a minority are trying to air over basics such as policies, procedures and authority.

But your final comment — "It's unfortunate that Gibbs aligns himself with those who see the glass as empty because they disagree with the basic concept of an Internet run for the benefit of the community rather than for just a few" — is ridiculous. And the implication that I support some kind of elite ownership of the Internet is nonsense. You show me a "Backspin" that even suggests that.

And when even your own Internet Engineering Task Force is unhappy (www.nwfusion.com/news/121licann.html) with the structure of ICANN, I think we can conclude ICANN's charter needs a little work.

But the fact is ICANN appears to be a fait accompli. And before we applaud the glass being seven-eighths or three-quarters or two-thirds or however full, we'd better make sure it is full of something we want to drink.

Have a safe holiday and, Scott, check that stocking. We know what Santa's giving you.

Festivities at nwcolumn@gibbs.com or (800) 622-1108, Ext. 7504.



Mark Gibbs



The latest on the Internet/intranet industry

FIRST RUDOLPH, NOW THE INTERNET Well, you've done it again. Sometime in July you vowed that this year, this time, you would get all of your Christmas shopping done early. You reiterated that promise on Labor Day, Columbus Day, Veterans Day and Thanksgiving. Now here it is, a mere four days before Dec. 25, and you've done nothing but fritter away your shopping opportunities.

Fortunately, there are a number of Christmas-themed Web sites to save your gift-procrastinating butt. So hitch up the reindeer for a cybersleigh Christmas run.

First stop, www.santa.com. From this site you can e-mail Santa, send an animated electronic card and, of course, buy lots of presents, including stocking stuffers such as Beanie Babies, toy phones and T-1 multiplexers.

Santa's site also has links to a number of online stores, such as Barnes and Noble, eToys, Music Boulevard, Hawaiian Flowers and Omaha Steaks ("Now order Bacon Wrapped Filets for only \$29.99 and get your choice of a FREE entree to each shipping address.")

If you just don't know what to give, www.santa.com provides gift tips from "celebrities" such as beauty expert Kay Casperson (who suggests Spice Girls Dolls and Windows 98) and home furniture chain store owner Lou Sagar (two books: *Zona Home* by Lou Sagar and *If You Only Knew How Much I Smell You* — *True Portraits of Dogs*, by Valerie Shaff).

Note to www.santa.com: These people are not celebrities. Now Tom Hanks and the guy who played the landlord in *Three's Company*, those are celebrities.

Note to Lou Sagar: Recommending your own book as a gift? Tres gauche!

On to www.christmas.com, which also provides links to a bunch of electronic stores where you can quickly knock some names off your gift list. And just in case your stress level is not adequately high, this site features a Christmas Countdown Around the World, so late shoppers in any time zone can know exactly how many days, hours and minutes before that long line at the local drug store suddenly looks less imposing.

The next page, at www.santaclaus.com, appears to be Santa's official home page. And a homey site it is. Besides gift recommendations, the site features Christmas humor ("What do elves learn in school? The Elfabet!") and Santa's Favorite Daily Quotation List ("I believe there are more instances of the abridgement of freedoms of the people by gradual and silent encroachment of those in power than by violent and sudden usurpations." — James Madison).

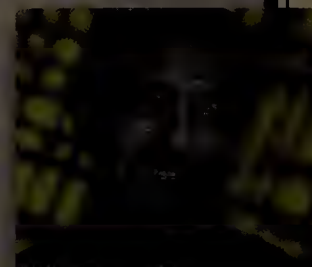
Apparently Santa has too much time on his hands. But you don't. Better get surfing.

WHERE THE REAL CELEBRITIES ARE Here's another Internet-inspired gift idea. Go to www.artiststores.com, a site run by American Digital Network (ADN) that features Web pages for popular entertainers such as The Beastie Boys, Marilyn Manson and Ozzy Osborne.

Except for the drugs, these sites offer you anything you could buy at a concert — T-shirts, stickers, bags and more concert tickets.

ADN, founded in 1995 and based in San Diego, is a start-up that provides Internet services to companies in the entertainment business. The company recently received a \$430,000 investment from electronic commerce vendor Open Market as part of a strategic partnership deal.

'Net Buzz would never solicit a last-minute gift, but no good Internet- or intranet-related news, gossip or rumor will be turned down. Shares of most Internet stocks, however, will be rejected. Contact Chris Nerney at (508) 820-7451 or cnerney@nuru.com.



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